

# ARCHITECT

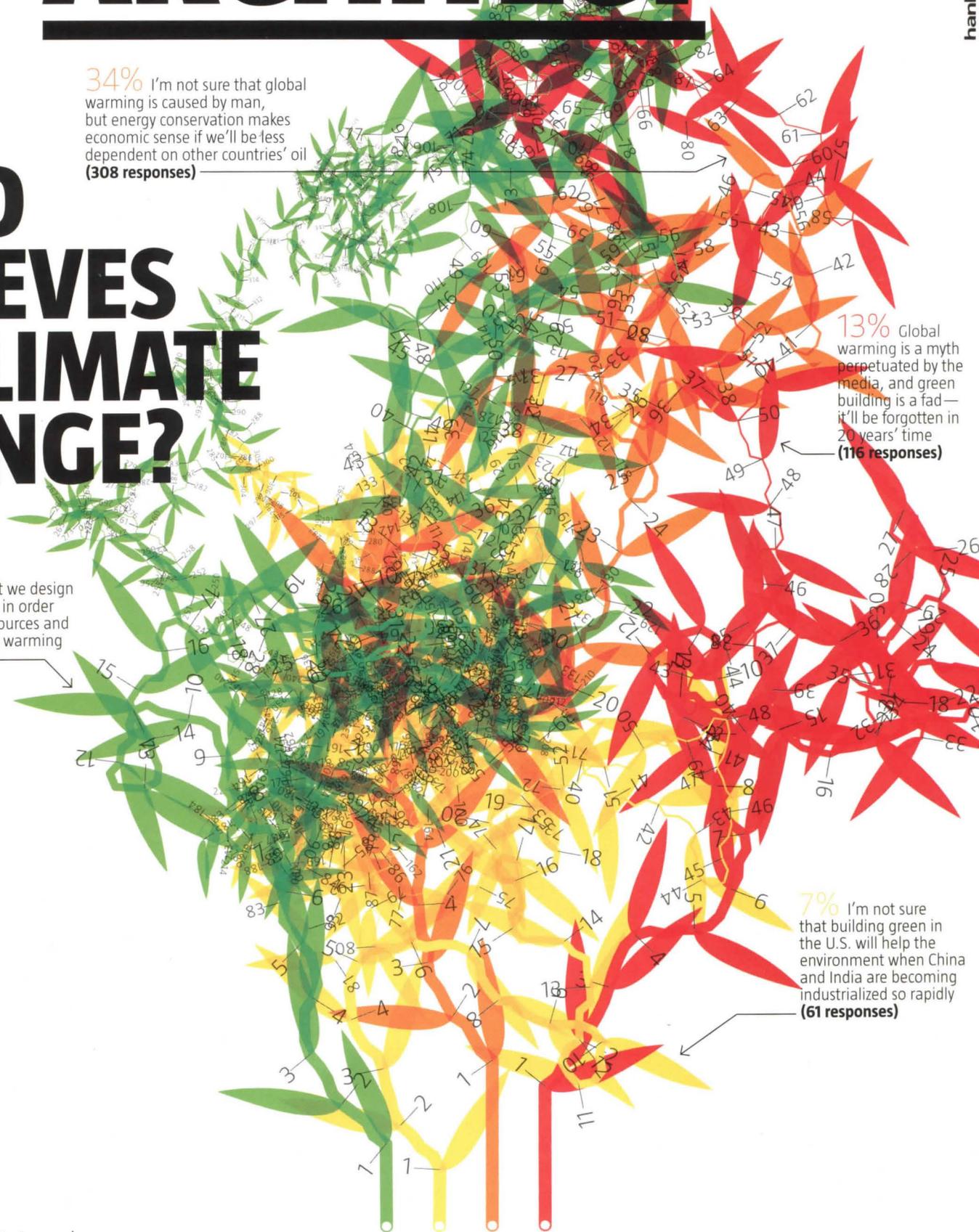
## WHO BELIEVES IN CLIMATE CHANGE?

**34%** I'm not sure that global warming is caused by man, but energy conservation makes economic sense if we'll be less dependent on other countries' oil (308 responses)

**13%** Global warming is a myth perpetuated by the media, and green building is a fad—it'll be forgotten in 20 years' time (116 responses)

**46%** It's vital that we design and build sustainably, in order to conserve scarce resources and prevent further global warming (419 responses)

**7%** I'm not sure that building green in the U.S. will help the environment when China and India are becoming industrialized so rapidly (61 responses)



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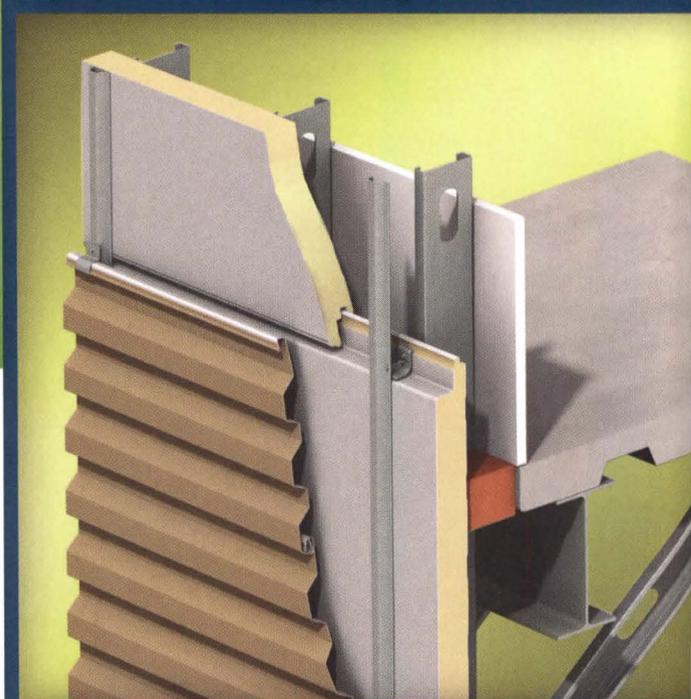
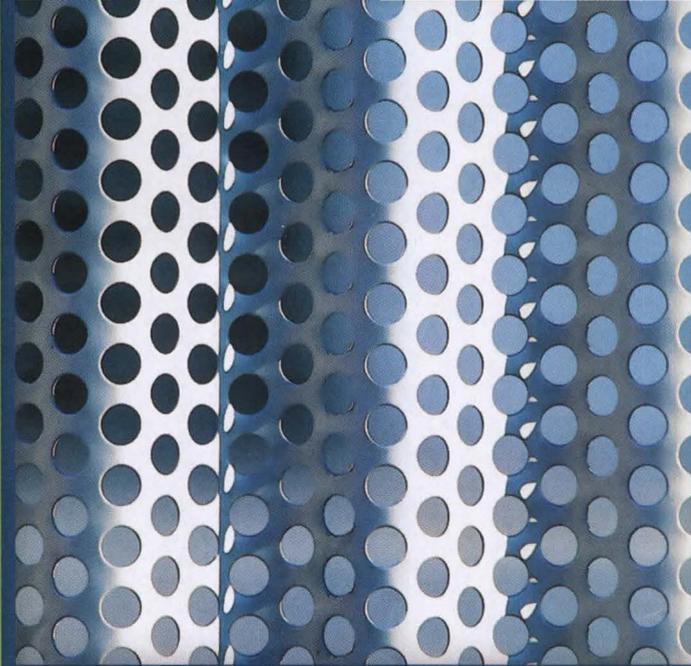
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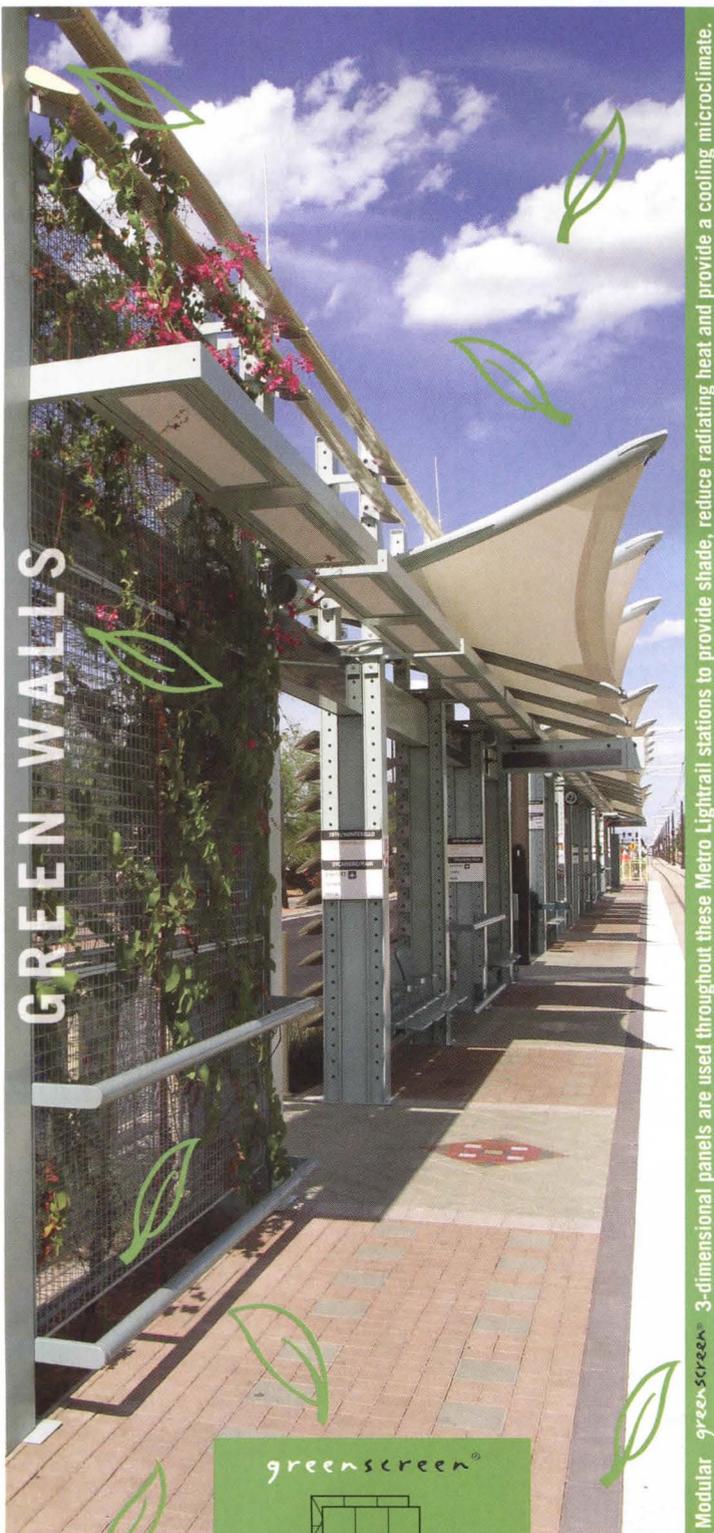
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Ned Cramer  
[ncramer@hanleywood.com](mailto:ncramer@hanleywood.com)

**MANAGING EDITOR**  
Greig O'Brien  
[gobrien@hanleywood.com](mailto:gobrien@hanleywood.com)

**ART DIRECTOR**  
Aubrey Altmann  
[aaltmann@hanleywood.com](mailto:aaltmann@hanleywood.com)

**EXECUTIVE EDITOR**  
Amanda Kolson Hurley  
[ahurley@hanleywood.com](mailto:ahurley@hanleywood.com)

**SENIOR EDITORS**  
Katie Gerfen  
BUILDINGS  
[kgerfen@hanleywood.com](mailto:kgerfen@hanleywood.com)

Braulio Agnese  
DEPARTMENTS & WEBSITE  
[bagnese@hanleywood.com](mailto:bagnese@hanleywood.com)

**ASSISTANT MANAGING EDITOR**  
Jennifer Lash  
[jlash@hanleywood.com](mailto:jlash@hanleywood.com)

**ASSOCIATE EDITOR**  
Kimberly R. Griffin  
PRODUCTS  
[kgriffin@hanleywood.com](mailto:kgriffin@hanleywood.com)

**SENIOR GRAPHIC DESIGNER**  
Marcy Ryan  
[mryan@hanleywood.com](mailto:mryan@hanleywood.com)

**EDITORS AT LARGE**  
Edward Keegan, Vernon Mays,  
Hannah McCann

**CONTRIBUTING EDITORS**  
Elizabeth Evitts Dickinson, John Morris  
Dixon, Thomas Fisher, Linda Hales,  
Lance Hosey, Margot Carmichael Lester,  
Bradford McKee, Mimi Zeiger

**CONTRIBUTING PHOTOGRAPHERS  
AND ILLUSTRATORS**  
Ian Allen, Peter Arkle, Catalogtree,  
Noah Kalina, Mike Morgan

**Online**

**CHIEF DESIGNER**  
Thomas C. Scala

**SENIOR WEB PRODUCER**  
Richard Stirba

**Services**

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ARCHITECT  
P.O. Box 3494  
Northbrook, IL 60065-9831

**Production**

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AND PRODUCTION TECHNOLOGIES**  
Cathy Underwood

**PRODUCTION MANAGER**  
Paige Hirsch

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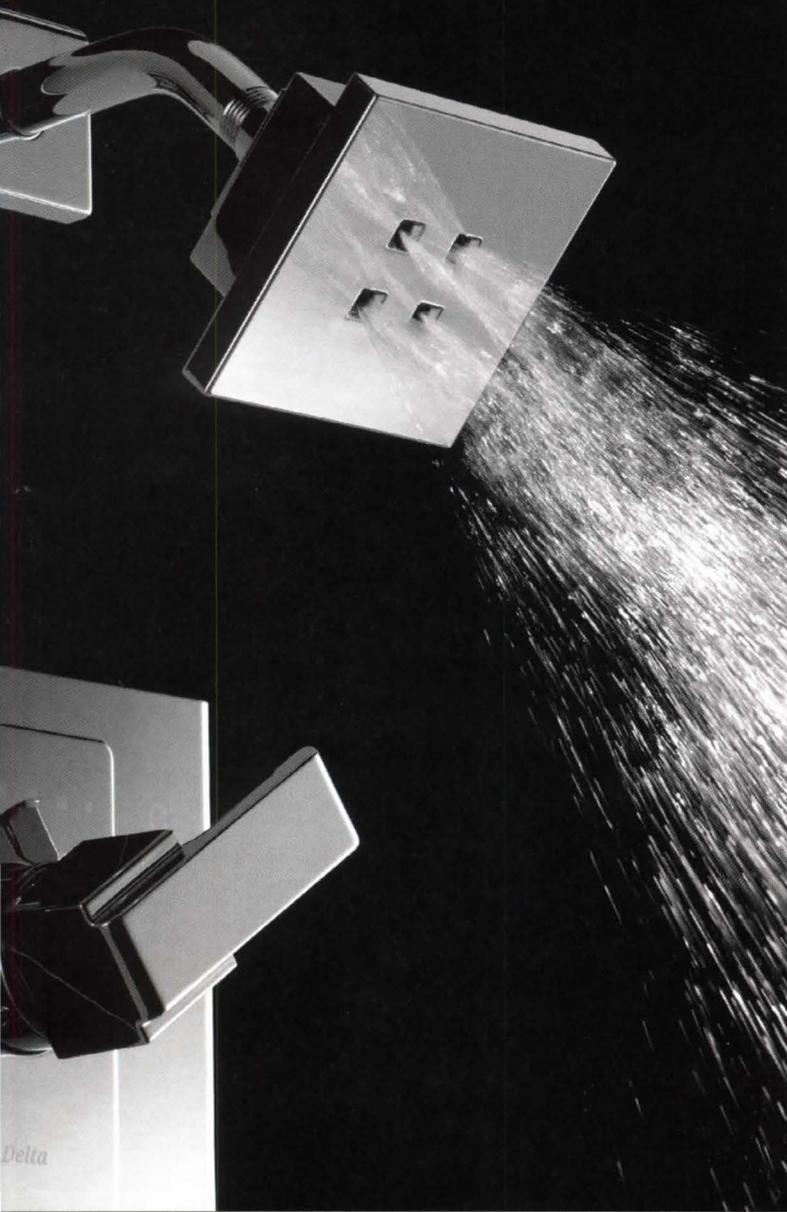
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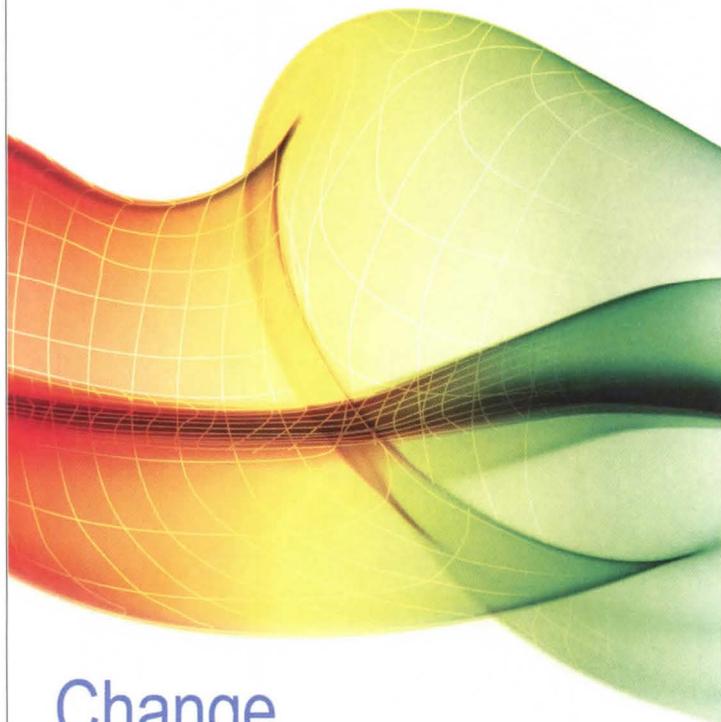
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**EXECUTIVE DIRECTOR,  
COMMERCIAL DESIGN AND  
CONSTRUCTION**  
Patrick J. Carroll  
[pcarroll@hanleywood.com](mailto:pcarroll@hanleywood.com)  
773.824.2411

**PUBLISHER, COMMERCIAL DESIGN**  
Russell S. Ellis  
[rellis@hanleywood.com](mailto:rellis@hanleywood.com)  
202.736.3310

**REGIONAL SALES MANAGER, EAST,  
TX, OK, AR, LA, FL**  
Michael Lesko  
[mlesko@hanleywood.com](mailto:mlesko@hanleywood.com)  
203.445.1484

**REGIONAL SALES MANAGER,  
MID-ATLANTIC AND SOUTHEAST**  
Nick Hayman  
[nhayman@hanleywood.com](mailto:nhayman@hanleywood.com)  
202.736.3457

**REGIONAL SALES MANAGER, WEST**  
Mark Weinstein  
[mweinstein@hanleywood.com](mailto:mweinstein@hanleywood.com)  
310.798.4030

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Michael Gilbert  
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773.824.2435

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LIGHTING**  
Cliff Smith  
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**REGIONAL SALES MANAGER, CANADA**  
D. John Magner  
[jmagner@yorkmedia.net](mailto:jmagner@yorkmedia.net)  
416.598.0101, ext. 220

**ACCOUNT MANAGER, CANADA**  
Colleen T. Curran  
[ctcurran@yorkmedia.net](mailto:ctcurran@yorkmedia.net)  
416.598.0101, ext. 230

**GROUP PUBLISHING SUPPORT MANAGER**  
Angie Harris  
[aharris@hanleywood.com](mailto:aharris@hanleywood.com)  
773.824.2415

**MARKETING MANAGER**  
Lauren Cardinet  
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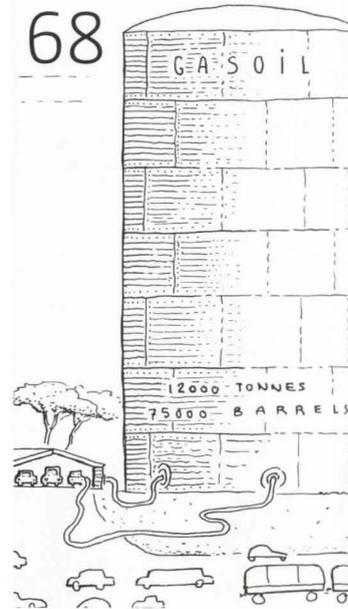
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“People I work with got into this in the Carter administration, and we’ve been holding on by our fingernails ever since.”

**EDWARD ARENS**, a professor of architecture at the University of California, Berkeley, talking about the unfortunate state of funding for building science research in “Shaky Foundation,” page 70.

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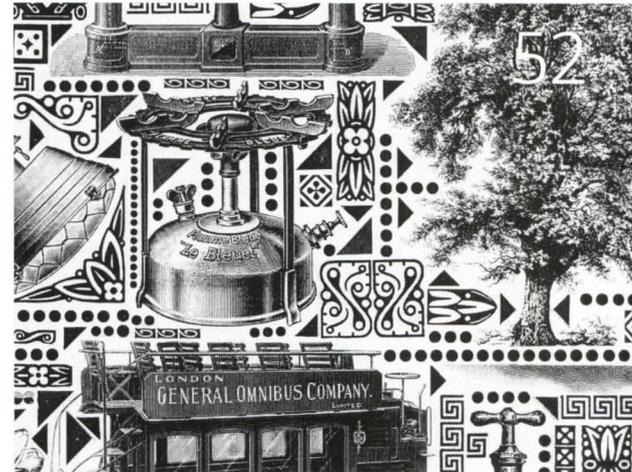
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**Right** The Taubman Museum of Art in Roanoke, Va., is a sign of the city's prosperous past few years.

**Far Right** Sustainable living is as much about individual decisions as it is about government policies, writes Alex Krieger.



TIMOTHY HURSLEY



LORENZO PETRANTONI

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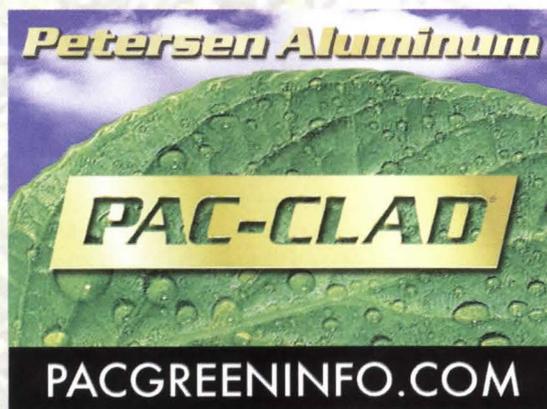
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Two different architects won P/A Awards for the same project: the Art Center College of Design. THOMAS FISHER

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# A CIVIL DEFENSE

I'VE ALWAYS ASSUMED that a healthy majority of American architects believe in climate change, consider it a serious problem, and endorse sustainable design as a worthwhile response.

I stand corrected.

Over the summer, 960 readers of ARCHITECT participated in a survey about their green beliefs ("Surprising Shades of Green," page 60). In it, we asked participants to select from four statements the one that best characterizes their attitude toward sustainability. Fewer than half (46.4 percent) chose the statement, "It's vital that we design and build sustainably, in order to conserve scarce resources and prevent further global warming." Fewer than half. Apparently I live in a bubble. An East Coast, media-elite, socialist bubble.

The majority of respondents to our survey expressed some degree of skepticism about climate change, either questioning its validity or the value of sustainable design. One group (12.8 percent) dismissed the issue outright: "Global warming is a myth perpetuated by the media, and green building is a fad—it'll be forgotten in 20 years' time." Yikes. Others (6.7 percent) doubted that green-building efforts in America could offset the damage caused by industrialization in China and India.

The largest (and to me, most interesting) group of naysayers (34.1 percent) fell somewhere in the middle, subscribing to the following statement: "I'm not sure that global warming is caused by man, but energy conservation makes economic sense if we'll be less dependent on other countries' oil." These constitute the swing votes, an architecture-profession echo of the beliefs of the majority of Americans.

And just what do Americans believe? According to a nationwide voter survey the AIA conducted earlier this year, 54 percent of respondents said they would oppose a tax of 50 cents per gallon of gasoline "to reduce global warming, cut carbon emissions, protect the environment, and fund the development of alternative fuels and clean, new energy sources"; by contrast, 56 percent said they would support the same tax "to hold down oil prices and end America's dependence on foreign oil."

What gives? Same tax, same outcome. Yes, but different motive. For many Americans, the threat of environmental calamity is simply too abstract or remote for them to take action ... to make a personal sacrifice for the common good. Great Recession economics and post-9/11 national security are much more immediate, comprehensible concerns than a fractional uptick in the thermometer or a bunch of scientists crying wolf.

Smart architects sell green design to skeptical clients in the name of cost savings: "Trim those operating expenses (oh yeah, and reduce your carbon footprint)." Imagine an even bigger sales job along the

same lines: a massive national investment in high-performance building—not to mention alternative energy, high-speed rail, and other holy grails of the sustainability movement. In the current political climate, this may seem like a pipe dream, but apparently it could be a reality if the pitch simply was made in the name of cutting the flow of dollars to the Middle East.

The \$1 trillion construction industry accounts for 6 percent of GDP, even in the current slump. An industry that large should have no problem pushing policy. And we have some serious allies. At an awards dinner I attended this summer for the Asia Society, honoree Energy Secretary Steven Chu spent nearly all his lectern time talking to the crowd of diplomats and policy wonks about building performance.

So what would happen if architects, builders, engineers, developers, and manufacturers set aside their differences, hired the right lobbyists, and successfully parlayed the green dream into a massive market and unshakable mandate for high-performance, low-energy, green buildings? A good thing, right?

I'd say be careful what you wish for.

The *New York Times* op-ed columnist Thomas L. Freidman (of *The World Is Flat* fame) has gone blue in the face complaining that the U.S. has fallen far behind Germany, Japan, and even China as a consumer and producer of green technology. (The environmental benefits are only half his story; he thinks we're missing out on the biggest business deal since the rise of the personal computer.) This national shortcoming applies not just to solar-panel fabrication, the subject of one Freidman diatribe, but to architecture as well.

Programs such as LEED and Energy Star are important first steps in the long hard march toward a green future, and many architecture firms and schools have made their own remarkable contributions. But long-term progress depends on a massive intellectual and financial investment in building science research.

As Elizabeth Evitts Dickinson's article, "Shaky Foundation" (page 70), makes painfully clear, there is dangerously little R&D funding available for the building sciences in the U.S. And as any architecture school professor can tell you, where there's no funding, there's no research.

According to Mark Frankel, technical director of the nonprofit New Buildings Institute, the building sector spends one-tenth as much on R&D as the national average for other industries. This is shameful. So if the dream of sweeping green legislation somehow does come true, architecture may not be ready for it.

Neil Crane

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## LETTERS

### TRUST ME, I'M A (FAKE) ARCHITECT, SEPTEMBER 2009

Way to go on the "Trust Me" article! I am the state president of the *Association of Licensed Architects in Minnesota*. We are having the chairman of our state board of architecture and engineering speak tomorrow. Your article will be lifted up for all to read.

We need a lot more of this type of exposure. Most in the profession are afraid to speak out. The profession is a great one, and is in need of some TLC (because of high unemployment at 35 percent or more, and low income at \$22-an-hour take-home pay).

*Darrel LeBarron, Station 19 Architects, Minneapolis*

I'd love to see an article on the use of the title "architect" within the computer software industry. Why aren't they held to the same laws? My fellow architects find this incredibly frustrating, especially in the current economic situation where multitudes of architects are looking for work. On a job search engine like Monster, all the architect listings are for software developers.

*Tamara Gaumont, Illinois*

It's amazing how everybody wants to be an "architect." As a designer in pursuit of registration, I have always had a deep respect for the profession and what it means to be called an architect. What I do not understand is why the term is used so flagrantly in other professions (for example, in IT). Within our industry, we are so quick to condemn those

who use the term "architect." What about outside of our industry?

*Kurt F. Rhea*

### THE KING IS DEAD, AUGUST 2009

I wonder what Julius Shulman might have said about your very bold headline? I got to know Julius when I was given my first assignment, to review Victor Gruen's Wilshire Terrace in Los Angeles for *P/A* magazine's December 1959 issue. I found him to be the perfect colleague, since he was not only an expert in the field of photography but also had the eyes of an architect. In other words, it seemed that he instinctively saw the building as the architect had wished to see it printed on the page.

At the end of the shoot, we found the perfect place for a debate about the current architectural state of affairs—the Case Study houses, the work of the Eameses, the fine old Bradbury Building. All this was in his own backyard, under the big avocado tree.

*Ilse Meissner Reese, Sharon, Conn.*

### PRODUCTS & R+D AWARDS, AUGUST 2009

I hope we've all written our thank you notes to Erwin Hauer. Interlam's "new" Screens (page 35) and the Active Phytoremediation Wall System (page 48) have no mention of his work. Maybe we can liken these products to adaptive reuse. As a fan of intellectual property and copyright protection, at the very least we need to acknowledge the pioneer.

*Terry Purdue, Connecticut*



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EDITED BY BRAULIO AGNESE

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**Carl Galioto**, formerly a partner at Skidmore, Owings & Merrill, joined **HOK** as a senior principal. He will be the firmwide leader of HOK's BIM-focused buildingSMART initiative and will chair the firm's global project delivery board.



**Heller Manus Architects**, which recently put the finishing touches on its master plan for the metropolitan northern axis of Guangzhou, China, won a commission from the city to create a master plan for **Guangzhou's growing southern axis**.



**SHoP Architects** joined **Ellerbe Becket** in an effort to salvage the design of **Barclays Center**, the basketball arena piece of Brooklyn, N.Y.'s massive Atlantic Yards development.

# Joan Goody, 73, Dies



**JOAN GOODY**, senior principal of Boston firm Goody Clancy and one of the country's most prominent women architects, died Sept. 8. She was 73.

A native of Brooklyn, N.Y., Goody (born Joan Edelman) studied history at Cornell University and received her M.Arch. from Harvard's Graduate School of Design (GSD). Shortly after graduating, she married fellow architect Martin Goody and joined his small firm, becoming a partner in 1968.

As the firm grew, Goody cemented its reputation

as a leader in affordable housing, urban planning, and historic preservation with an approach to building design that was distinctly modern yet modest and contextual. Signature projects that Goody helmed include the restoration and expansion of H.H. Richardson's Trinity Church and the Harbor Point mixed-income community in Boston.

A respected civic leader as well as architect, Goody chaired the Boston Civic Design Commission for 10 years. She was named a fellow of the AIA and in 2005 received the Award of Honor for lifetime achievement from the Boston Society of Architects (BSA).

Howard Elkus, a founding principal of Elkus Manfredi Architects who attended the GSD with Goody, praised her "steadfast leadership of a prominent national firm." Calling her "an inspiring role model for the rise of women in the profession," Elkus added, "Joan Goody has left her mark on Boston, and her presence surely will be missed."

In her honor, Goody Clancy is establishing the Joan Goody Scholarship Fund for Civic Engagement, which will be managed by the BSA. **AMANDA KOLSON HURLEY**

## MACKINTOSH MEETS HOLL AT GLASGOW SCHOOL OF ART

**SCOTLAND'S GLASGOW** School of Art has selected Steven Holl Architects to design a new building on a site directly opposite the school's famous, century-old Mackintosh Building, named for its architect, Charles Rennie Mackintosh.

Holl's firm, working in collaboration with Scottish firm JM Architects, beat out six competitors on the international short list: Benson & Forsyth; Elder and Cannon; Francisco Mangado Architects with ZM Architecture; Grafton Architects; Hopkins

Architects; and John McAslan + Partners with Nord Architects.

This will be the first building in the United Kingdom for Holl, whose recent projects include the Linked Hybrid urban complex in Beijing and the Nelson-Atkins Museum of Art addition and renovation in Kansas City, Mo.

The selection committee—chaired by architect David Mackay—unanimously selected Holl's firm based on its "poetic use of light" and a submission that showed

"a singular creative vision, scale of ambition, profound clarity and respectful rivalry for the Mackintosh Building," according to a college press release.

The new building—scheduled to open in time for the 2013–14 academic year—will include teaching and research facilities and constitutes the first phase of the college's expansion plan, which seeks to develop a coherent urban campus in the Garnethill neighborhood of Glasgow. **A.K.H.**

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# Architecture Nonprofits Get Their Own Association



Lynn Osmond, president, Chicago Architecture Foundation

**A CONFERENCE IN CHICAGO** next month marks the launch of the Association of Architectural Organizations, a new network of groups devoted to raising public awareness of architecture. It's the brainchild of Lynn Osmond, president of the Chicago Architecture Foundation, who spoke with ARCHITECT about its genesis. Learn more online at [architecture.org/aaoo](http://architecture.org/aaoo). **BRADFORD MCKEE**

**So this is sort of a meta-association. Who belongs, and what's the purpose?**

It's open to everybody who's providing architecture education to the public and to the profession: centers, museums, schools, and so forth. We really have no peer network.

**What are the AAO's top priorities?**

We want to have conferences to share best practices. We're

not going to be advocating policy at the government level, but advocating for a better-educated public. We can talk about architecture festivals. We can network the curators to get more exhibits traveling around the country.

**Where does the money come from?**

Initial funding came from the Driehaus Foundation and the Graham Foundation. The National Endowment for the Arts has given us some travel funding. And we've got about 20 founding members who've each given us \$1,000.

**What helps get regular people thinking about architecture?**

Public engagement. I love getting people on a tour who don't understand Mies. When it's done, they may not like him, but they understand him. And they understand that a glass house can sit respectfully next to a brick house.

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The conference is made possible through the generous support of the Graham Foundation for Advanced Studies in the Fine Arts.



## USGBC Honors 22 Green-Building Education Programs



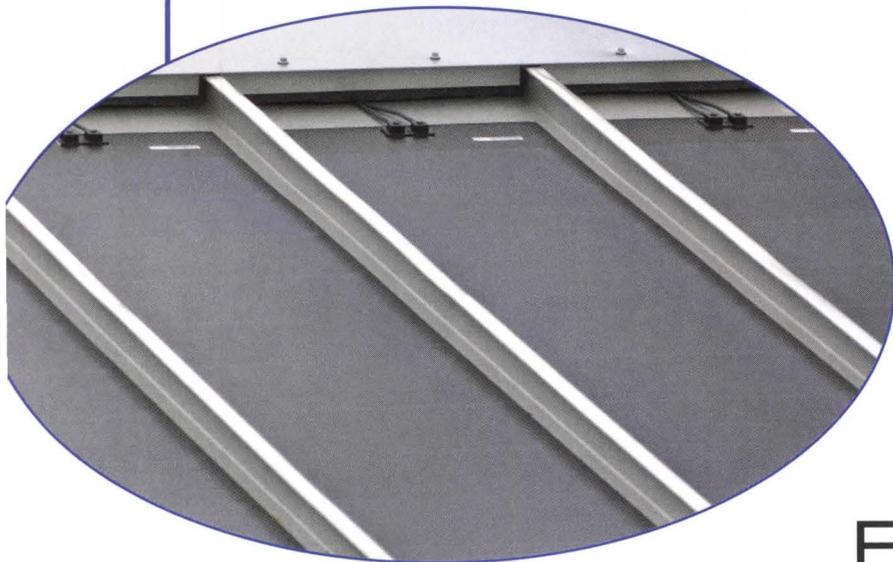
The U.S. Green Building Council has awarded the 2009 Excellence in Green Building Curriculum Recognition Awards and Incentive Grants to 22 groups and institutions. The awards, which come with a \$1,000 prize, honor existing green-building education projects and programs; the grants offer \$10,000 each to schools and organizations that are developing new curricula. Among the grant recipients: The **Ford Rouge Factory Tour**, for the K-12 program "Teaching Tools for Our Future: Green Building Design/Environmental Innovation at the Ford Rouge!" The Dearborn, Mich., auto factory complex, shown above, was given an eco-friendly overhaul by William McDonough + Partners earlier this decade. Learn more at [usgbc.org](http://usgbc.org).

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# Historically Black Colleges Get Stimulus



Emery Hall, by architect Frank Packard, was built in 1913 for Ohio's Wilberforce University, the oldest private black university in the nation. Currently owned by Central State University, the building was added to the National Register of Historic Places in 2005.

**TWENTY HISTORICALLY** black colleges and universities (HBCUs) are getting an infusion of stimulus money to preserve historic buildings, Interior Secretary Ken Salazar announced at a Sept. 18 press conference. Diverging from his prepared remarks, Salazar said the \$14.25 million in grants is "one small step of many that need to be taken to make sure that the American story is an all-inclusive story." Based on architectural significance and repair needs, the 21 projects on 20 campuses were chosen from 107 applications submitted in June. From 1980 to 2006, the National Park Service granted roughly \$3 million a year to HBCUs for preservation projects, but the grants required matching funds, which many schools failed to raise. U.S. Rep. James Clyburn (D-S.C.) successfully pushed for increasing funding and easing the match requirements in the 2009 American Recovery and Reinvestment Act. "We can't wait for cities and counties to raise the match," he told ARCHITECT in July. "What's good for the goose is good for the gander." **HANNAH MCCANN**

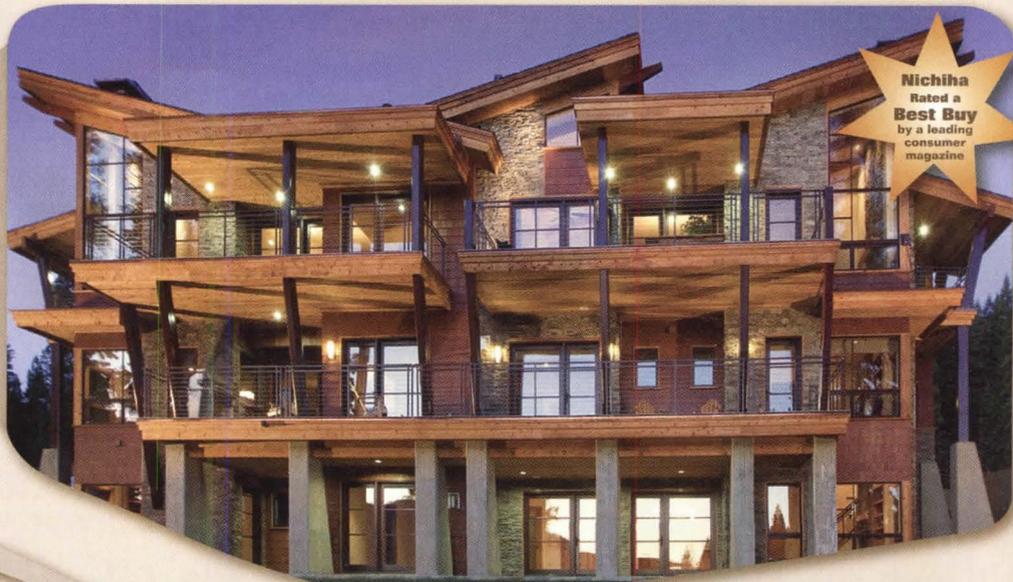
## GRANT RECIPIENTS

**Alcorn State University:** Belles Lettres Hall, \$400,000  
**Allen University:** Chappelle Auditorium, \$1,000,000  
**Bennett College:** Ethel Black Hall, \$400,000  
**Central State University:** Emery Hall, \$1,750,000  
**Cheyney University:** Melrose Cottage, \$300,000  
**Clark Atlanta University:** Trevor Arnett Hall, \$400,000  
**Dillard University:** Camphor/Hartzell Complex, \$800,000  
**Elizabeth City State University:** Moore Hall, \$500,000  
**Fisk University:** John Wesley Work House, \$89,516  
**Florida A&M University:** George M. Sampson Hall, \$700,000  
**Harris-Stowe State University:** Vashon Community Center, \$1,000,000  
**Howard University, Washington:** Miner Normal School, \$800,000  
**Kentucky State University:** Old Federal Building and Post Office, \$1,000,000  
**Langston University:** Cottage Row Historic District, \$500,000  
**Meharry Medical College:** Hulda Margaret Lyttle Hall, \$1,000,000  
**St. Paul's College:** The Saul Building, \$349,706; Fine Arts Building, \$245,000  
**Talladega College:** Foster Hall, \$700,000  
**Tougaloo College:** John W. Boddie House, \$829,007  
**West Virginia State University:** African Zion Baptist Church, \$123,570  
**Xavier University of Louisiana:** Administration Building, \$463,201

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# BNIM's Berkebile Wins 2009 Heinz Award

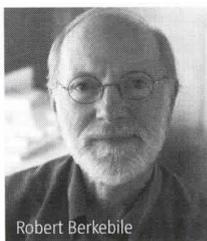
AUGUST 2009  
ARCHITECTURE  
BILLINGS INDEX

41.7



- ↑ 45.6 commercial
- ↑ 37.5 institutional
- ↓ 41.4 mixed practice
- ↑ 43.4 multifamily residential

SOURCE: AIA



Robert Berkebile

**KANSAS CITY, MO.-BASED** Robert Berkebile of BNIM Architects is a recipient of a 2009 Heinz Award, which focuses on an individual's contributions to create "a cleaner, greener and more sustainable planet."

The 72-year-old architect was founding chairman in 1990 of the AIA Committee on the Environment (COTE). Under COTE's auspices, Berkebile brought environmental and industry groups to the table, eventually hosting the meetings that led to the founding of the U.S. Green Building Council. When that new group began development of what became the LEED system, BNIM provided several pilot projects. "My colleagues made it happen in real masonry and steel," Berkebile says.

His interest in sustainability came from what he

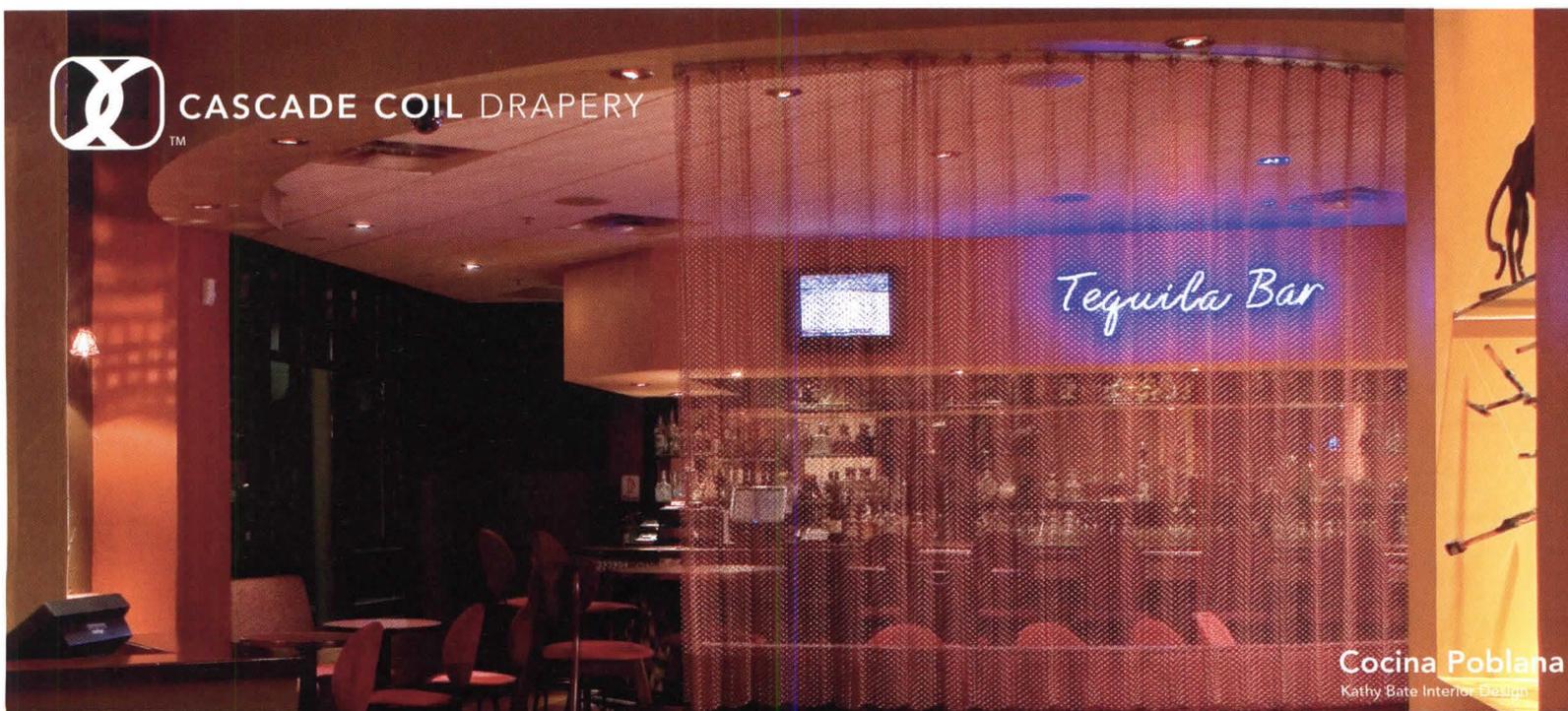
describes as "a painful epiphany." Berkebile was the designer of the Kansas City Hyatt Regency hotel whose walkway collapse on July 17, 1981, led to 114 deaths and more than 200 injuries.

Working on the rescue team, Berkebile asked himself, "What is the real impact of our designs on the people we serve?" For years afterward, he spent 85 percent of his time dealing with lawyers and lawsuits related to the tragedy. But the remaining 15 percent was devoted to talking to experts—scientists, environmentalists, architects, engineers, and others—about the larger ideas he grappled with on that tragic night in 1981. That initial small investment of time provided a framework for much of the conversations on sustainability that drive the profession today.

The \$100,000 award is one of 10 given annually by the Pittsburgh-based Heinz Family Foundation to honor former U.S. Sen. John Heinz (R-Pa.). **EDWARD KEEGAN**



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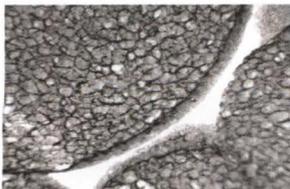
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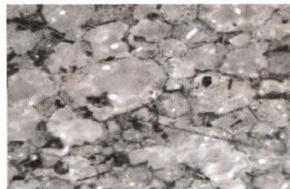
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\*ASHRAE 90.1; American Society of Heating, Refrigerating and Air-Conditioning Engineers, 1791 Tullie Circle, N.E., Atlanta, GA 30329. \*\*Competing types of rigid insulation include Expanded Polystyrene and Polyisocyanurate. †See actual warranty for details. The color PINK is a registered trademark of Owens Corning. ©2009 Owens Corning.

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# BUSINESS



TEXT BY EDWARD KEEGAN  
PHOTO BY STEFAN HESTER

Interviews are about more than a potential employer's current needs, says HOK senior vice president **Rebecca Nolan**: "It's not just a fit for today, but a fit that has the ability to evolve and grow" along with the organization.

→ BEST PRACTICES

## Let's Talk About It

THE FINAL ARTICLE IN OUR JOB-HUNT SERIES COVERS THE **INTERVIEW**, A PROCESS THAT CAN BE MORE THAN JUST A Q&A—BUT ONLY IF YOU'RE PREPARED.

**YOUR RÉSUMÉ AND PORTFOLIO** have done their work, getting you face time with one or more people at a firm—and possibly multiple firms. Now what? Rebecca Nolan suggests approaching your visit as an opportunity for true interaction, not just a question-and-answer session. The senior vice president at St. Louis–based HOK should know; much of her responsibility involves interviewing candidates for jobs within the 23-office organization. Trained as an interior designer, she previously served in a similar role for

SmithGroup's California practice group. Nolan sees the interview as a two-way conversation that doesn't stop with the hire. "The way we grow people is a passion of mine," she says.

### What should you ask before the interview?

Ask whom you are interviewing with and know their role in the organization.



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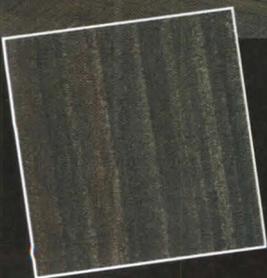
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business



**How should you prepare?**

Invest time. Understand the firm at every level you can. Know about the people, the organization, the projects, and their recent successes. Seek as much information as you can. Prepare questions in advance. What do you want to learn? Be an active listener while sharing pertinent data.

**How does the interview relate to your résumé and portfolio?**

When you get to the [interview] short list, you're prequalified: You've got the résumé and illustrated the skill set and the expertise for what the need might be.

**How do you differentiate yourself?**

It's about cultural fit. How do you understand the organization culturally and how it's evolving? See how you can be a part of the firm going forward.

**Is "be yourself" still a valid tip?**

Be your best professional self.

**Do social media have a role?**

They are platforms to find an alignment of connections. There's such transparency.

**In the era of Facebook and Twitter, how does one differentiate between the personal and the professional?**

Six degrees of separation is now two or three. My best professional self is when I relate as a real person to the person I'm trying to know. Drop your guard enough to be genuine. Bring your personal experiences to who you are as a professional.

**What can the length of an interview tell you?**

A positive and productive interview is a healthy exchange both ways—a true engagement over whatever the topic of conversation is. If the interview goes beyond its scheduled length, that means people are curious and they want to make time.

**What's the dress code?**

It has relaxed over the past decade, but it's OK to be a little more dressed up than the person who's interviewing you. That's respectful. If you're meeting with a few people, aim for the upper range of that group.

**Can you be overconfident?**

It's a balance. No matter how strong a candidate you are, humility has a role. If you're overconfident, you might step away from inquiry.

**Is there anything that you *have* to say?**

If this is a position you really want or an organization you really want to be a part of, say that.

**Is there an X factor?**

I look for a smile. I want to know that somebody has the capacity to be a happy person in the workplace. □

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→ STRATEGY

# Now In 3D

## COULD PORTABLE, EASY-TO-PRINT HOLOGRAMS BE THE NEXT BIG THING IN DESIGN VISUALIZATION?

TEXT BY NATE BERG

**"HELP ME, OBI-WAN KENOBI. YOU'RE MY ONLY HOPE."** That was the call of desperation from an imprisoned Princess Leia in the original *Star Wars* movie. She was just 12 inches tall at the time, and she wasn't even really there—she was a hologram. In the real world, holograms haven't quite yet reached that level, but they're getting close.

New file conversion and printing technologies are able to turn 3D renderings and plans from BIM programs into holographic images, giving architects a new way to visualize projects, from the design stage to construction. Printed onto a thin, rollable photographic film, holograms appear to jump off the page, offering a more immediate way of understanding the spatial implications of design.

The technology is being developed by Austin, Texas-based Zebra Imaging. The company has been working on the idea for several years, although architectural renderings originally weren't the intended application. Like many emerging technologies, Zebra's holograms first gained a foothold in the military world. The original hologram work was creating 3D maps of urban areas that members of the U.S. military could use to orient themselves and navigate in unfamiliar combat zones.

"We were imaging cities like Baghdad," says Zebra Imaging co-founder and chief technology officer Michael Klug. "From the urban planning component and even down to the individual structure representation, it's pretty straightforward" to make the transition into civilian architecture.

Klug and the rest of the Zebra team are banking on that connection as they introduce their production-scale printing process to the market this fall. They hope to integrate their technology into the day-to-day workings of architectural firms. To that end, **Zebra has been working with six architecture firms to produce pilot holograms of buildings: CollinsWoerman, Gehry Partners, Gensler, Leo A Daly, MulvannyG2 Architecture, and Skidmore, Owings & Merrill.** Zebra is trying to get a feel for how architects could use this technology and how it can best represent different stages of architectural design.

"I think it's one of the most unique technologies that's come out recently," says Dennis Shelden, chief technology officer at Gehry Technologies, the tech arm of Gehry Partners. "There's something about the way it allows you to understand the spatial nature of the thing that I think is really interesting."




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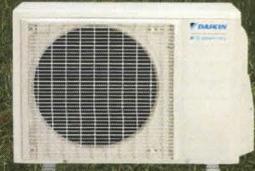


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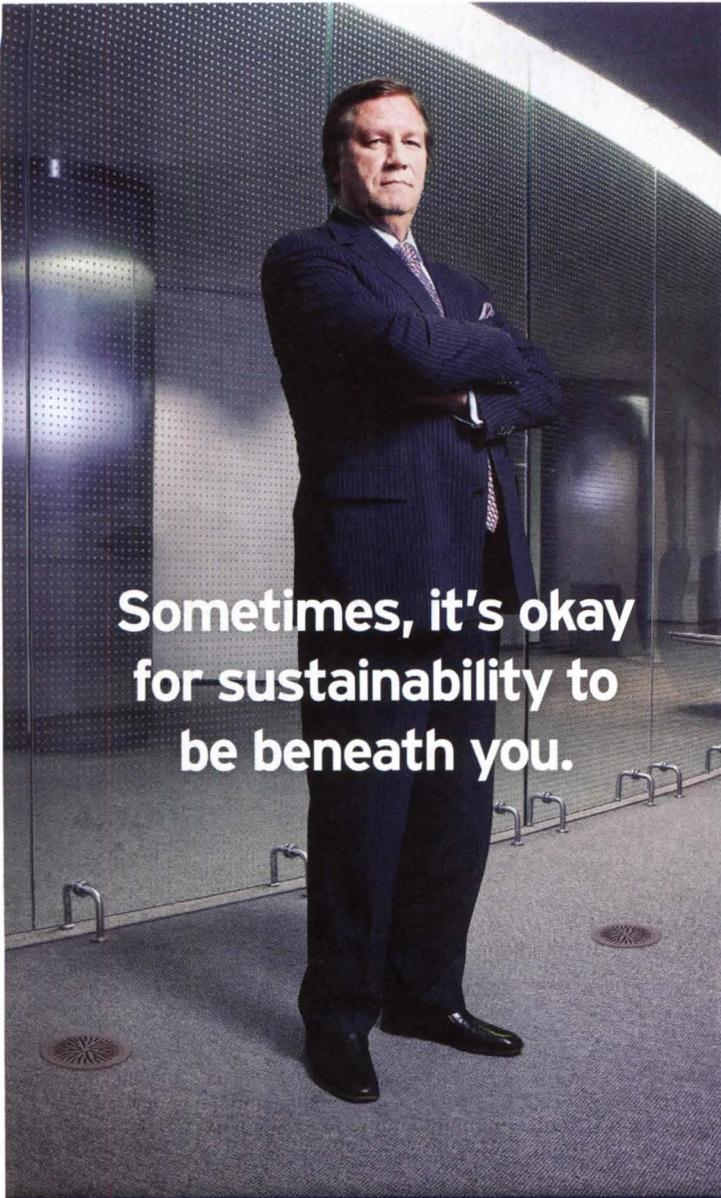
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business



Zebra Imaging's holograms for the AEC sector are reflection holograms: When illuminated from above, what first looks like plain black film communicates its 3D effect.

"It skirts that realm of media and movies," notes Hraztan Zeitlian, director of design for Leo A Daly's Los Angeles office. "It brings that excitement of the entertainment technology into architecture, which is really thrilling."

Though the holograms produced by Zebra for the firms have been mainly experimental, the architects involved are already plotting out how they'll use them. **For the most part, they are seen as a new element of the presentation**

**process**, offering clients a vivid and detailed view of the proposed design. Some foresee holograms being used in promotional materials once buildings have been completed and are on the market.

Gehry Technologies mainly has been using the holograms for internal communication of design ideas among architects, engineers, and construction specialists. The holograms also are helping them determine whether some designs are even feasible to construct. "The use of the technology for us in design is not so much about the aesthetics, or the spatial aspects of the building, as much as it is about the realization," Shelden says.

**While simple monochromatic holograms once took days or even weeks for Zebra to print, multicolor and multichannel holograms now can be printed in a matter of hours.** Though the cost to print a single 36-by-24-inch hologram panel can reach \$3,500, the price point is becoming competitive with the cost of a physical model. For some elaborate models, a hologram is actually the cheaper option.

"Physical models and representations of architectural models can take a lot of time to produce—usually a couple of weeks of some poor associate architect's time," Klug says. "These holograms are produced very rapidly."

Because of the increasing efficiency of hologram printing and the high costs of model-making, some of the architects involved in the pilot predict there'll be a hologram display in most architectural presentations eventually. "Holograms will probably be used, I would guess, more so than physical models," says Reg Prentice, the regional applications manager at Gensler. "But I'd also be pretty certain that physical models aren't going to go away by any means. They'll always have their place."

Zebra is now working on a dynamic display that will show animated holograms that change before the viewer's eyes, like a 3D video that seemingly enters real space—but without 3D glasses (or R2-D2). **The technology could even enable architects to change their BIM models and produce updated hologram displays on the fly.** It's still a few years off and probably will emerge first in the military realm. Even so, architects seem happy with the functionality they've seen with the current holograms.

"Potentially, you can tell a richer story than you can with a physical model," Prentice says. And while he concedes that a traditional rendering is still a faster, easier, and cheaper option, he sees a lot of possibility.

"It's a new take on communication of spatial information that I don't think architecture has really explored yet or had the opportunity to explore," Shelden says. "We don't know where it's going, but we've got some good ideas." □

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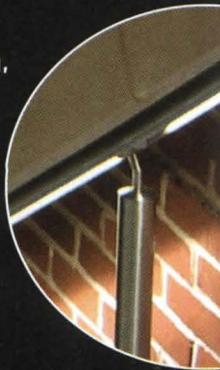


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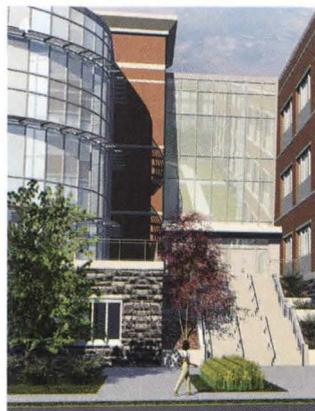
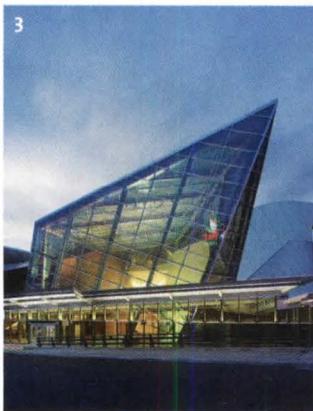
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business

→ LOCAL MARKET

# Roanoke, Va.

TEXT BY MARGOT CARMICHAEL LESTER



**DESPITE THE DOWNTURN**, Roanoke, Va., has had a building boomlet over the past two years, with a number of new projects dotting the landscape. One highlight is the new Taubman Museum of Art (above left), by Randall Stout Architects, which opened in 2008.

Since its founding in 1852, Roanoke, originally known as Big Lick, has been the commercial hub of the Roanoke Valley thanks to the river (also named Roanoke) that bisects the town. This brought a rail line and the Norfolk & Western steam engine manufacturing facility. Today, the city retains some rail business—it's a major hub in Norfolk Southern's freight network—but has evolved into the retail and healthcare hub for the surrounding region.

"One of the major factors driving development is the Virginia Tech Carilion School of Medicine" (above right), explains Nicole Hall, an architectural designer at Clark Nexsen's local office. (Clark Nexsen was not involved with the project, which was designed by AECOM.) "[It] will have a huge impact on our economy, bringing more students and higher-paying job opportunities."

That's important to a region working to prevent brain drain. "It's been tough, but Roanoke has many things going for it in the quality-of-life arena," says John Garland, president of home-grown firm Spectrum Design. Positives include ample recreational opportunities and a small-town feel. A downtown revitalization project also entices those seeking an urban experience. "Roanoke is steady and sure and will continue to grow," Garland says. □

## 1. Center in the Square

**ARCHITECT:** Spectrum Design, Roanoke. **COMPLETION:** 2011. **BRIEF:** \$21 million, 160,000-s.f. cultural center incorporates a green roof with a butterfly garden in the heart of downtown.

## 2. Northside High School Renovation/Addition

**ARCHITECT:** Spectrum Design. **COMPLETION:** 2009. **BRIEF:** \$28 million project features a geothermal heating/cooling system with 154 wells.

## 3. Taubman Museum of Art

**ARCHITECT:** Randall Stout Architects, Los Angeles. **COMPLETION:** 2008. **BRIEF:** Stout, designer of the \$66 million, 81,000-s.f. downtown building, previously worked at Gehry Partners.

## 4. Virginia Tech Carilion School of Medicine and Research Institute

**ARCHITECT:** AECOM, Roanoke. **COMPLETION:** 2010. **BRIEF:** 155,000-s.f. research and educational facility in a former industrial area has a native Hokie stone foundation and a green roof.

## POPULATION/EMPLOYMENT

Current population: 302,573; employment fell 3.1% from June 2008 to June 2009.

## OFFICE MARKET

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## RESIDENTIAL MARKET

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## MARKET STRENGTHS

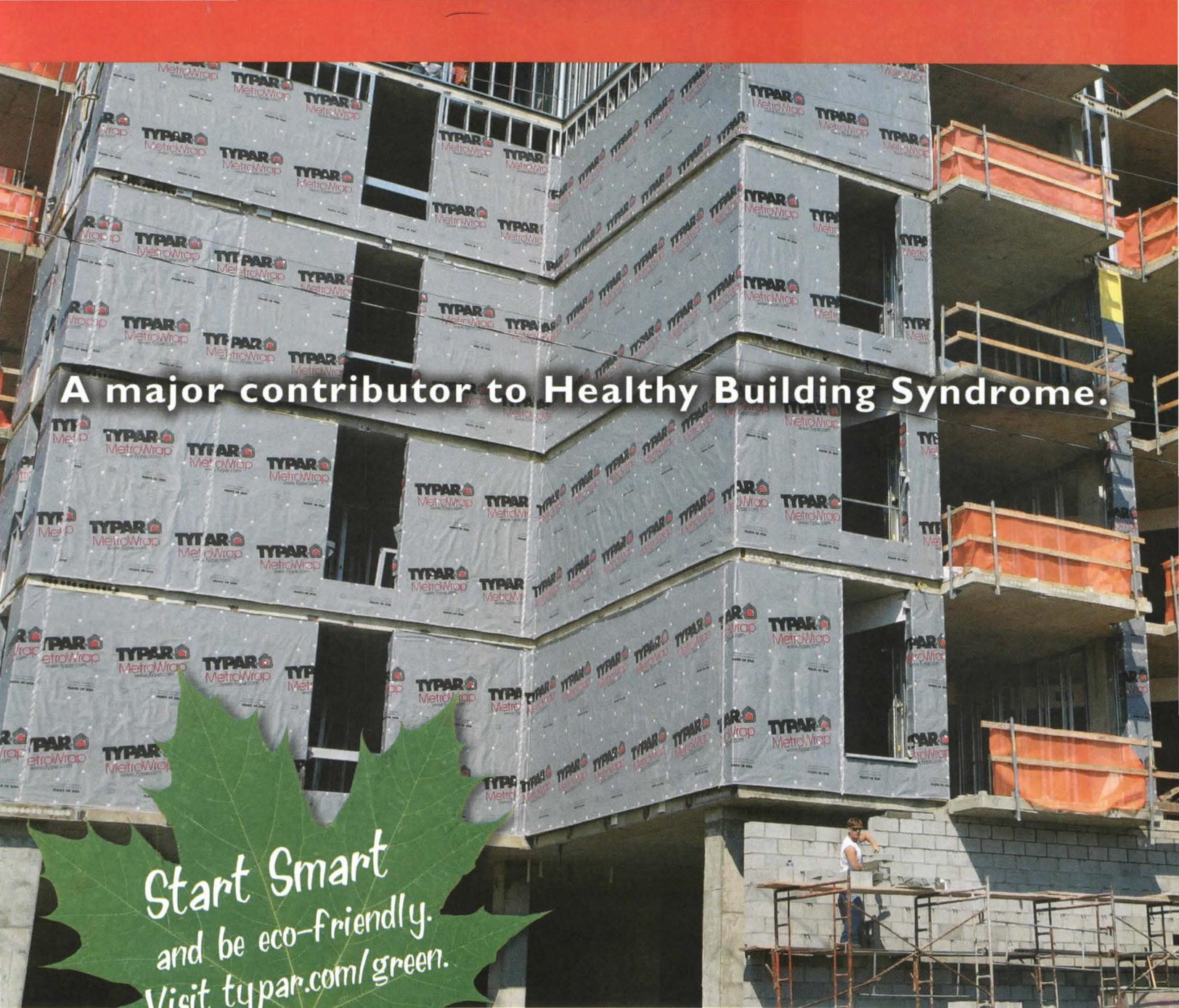
- Low costs of labor and living
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## MARKET CONCERNS

- Lack of developable land
- Attracting/retaining a highly educated workforce
- Maintaining momentum through the recession

## FORECAST

"I believe Roanoke is currently at a tipping point," says Clark Nexsen's Nicole Hall. "We will continue to see improvements to our downtown area and expansion of our greenway system. In addition, there are several organizations working on ways to make Roanoke a sustainable and green community."



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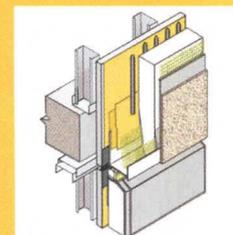
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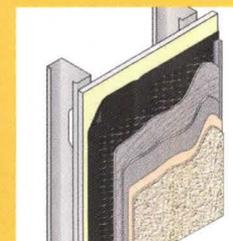
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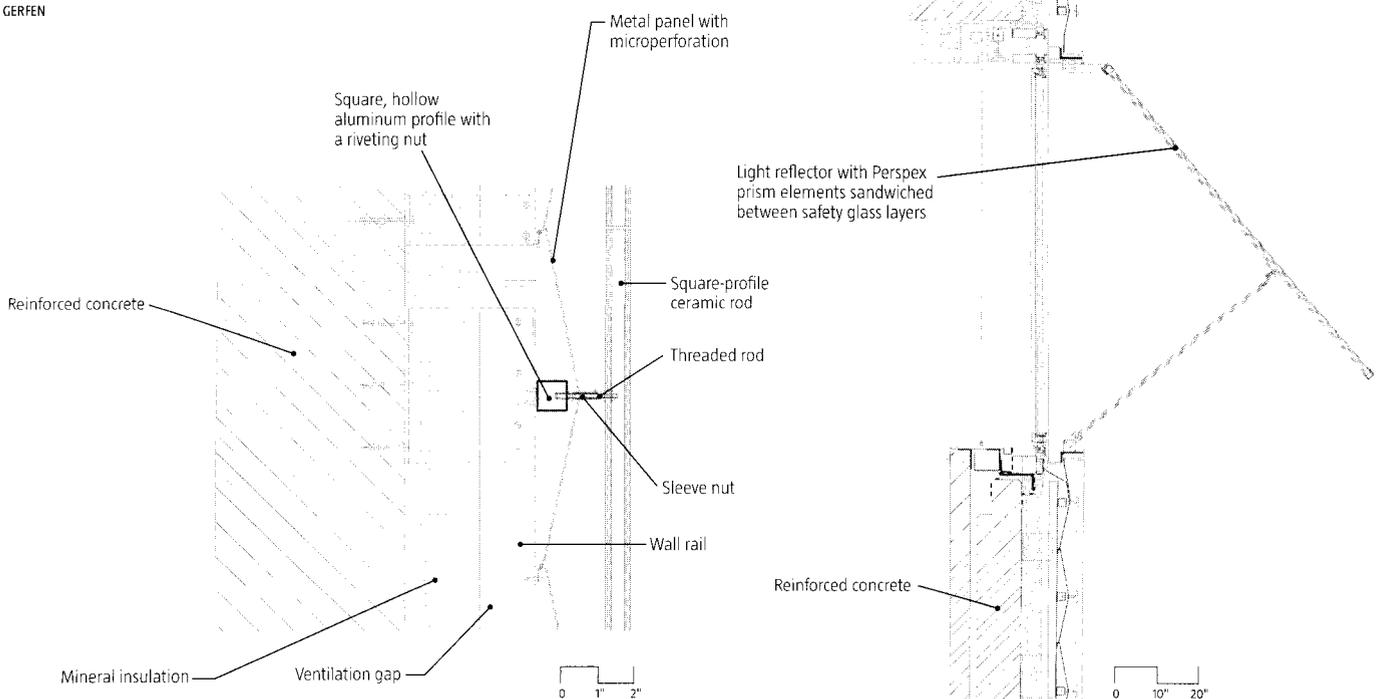
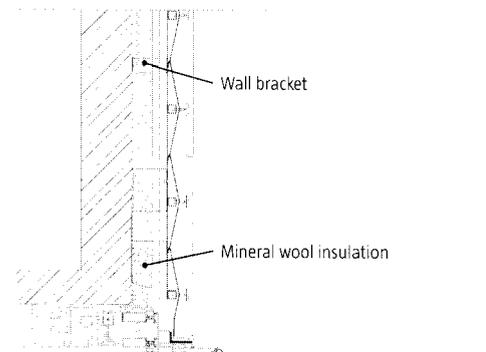
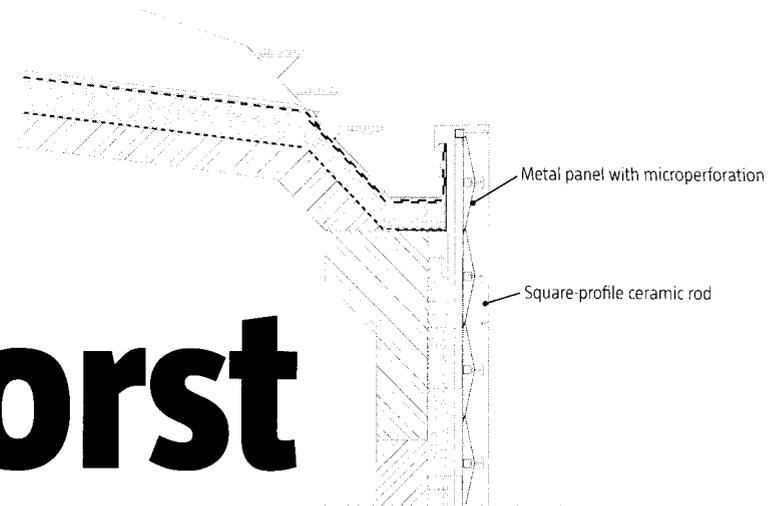
# TECHNOLOGY

→ DETAIL

# Brandhorst Museum

Architect: Sauerbruch Hutton, Berlin  
Location: Munich

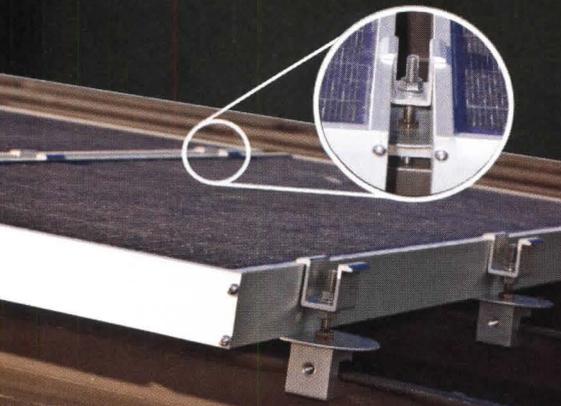
TEXT BY KATIE GERFEN





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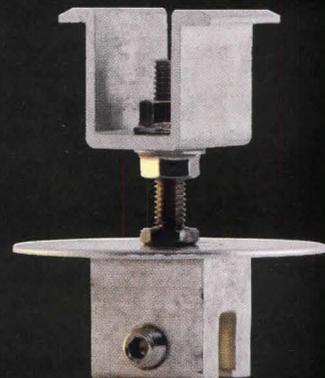


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**THE COLLECTION AT** the new Brandhorst Museum in Munich's arts district may contain works by the likes of Pop Art icon Andy Warhol, but the 130,000-square-foot museum's vibrant façade is all Sauerbruch Hutton. The Berlin-based architecture firm—known for its use of color in its projects—was one of 25 firms in an invited design competition that began in 2002. It won the contract with a proposal about using bright colors on a two-layer façade. "We had the idea that we would have a certain depth, and a contrast between an outer layer and an inner layer that looked very different close up and from far away," says project architect David Wegener.

After many iterations, the result is a screen of 36,147 individual 1½-inch-square and 44-inch-long ceramic sticks, vertically mounted about 1½ inches in front of a horizontally oriented folded metal siding system. This provides the depth that the design team was after, and the 2½-inch gap between the vertical rows of rods allows the metal siding to show through, creating a visual effect that makes the façade look different from every angle. G&H Isover—the project's façade consultant—contracted with NBK Ceramic to produce the sticks and glaze them in the factory. NBK is the same company that made the horizontal rods used on the Renzo Piano–designed New York Times building. In fact, the sticks used on the Brandhorst Museum are "exactly the same material, but their profiles are round and ours

are square," Wegener says. And then there's the color.

The colors are split into three families, each with eight shades, that are arranged to help define the mass of the building. "We like the material because even though it is produced in an industrial scale, it has a handmade touch," Wegener says. Not to be left out, the folded metal siding also features two alternating colors behind each color family of glazed ceramic.

Each stick has two bolts embedded in the material that connect to bolts threaded through the folded metal cladding through predrilled holes. The two bolts are connected by a hand-applied nut, and the spacing is so exact that the effect is a continuous screen.

The visual effect is impressive, but the reasons behind the double façade are more than just aesthetic. Neighbors on this residential street were concerned about increased noise levels, so the façade is engineered to absorb sound. The metal cladding is perforated and backed—after an airspace that is 2⅓ inches at the building's base—by a 4¾-inch-thick batt of insulation. In lieu of a foil coating, the insulation is treated with a hydrophobic coating that leaves the material bare but weatherproof—improving sound absorption. "We couldn't prove it in simulation beforehand," Wegener says, "but it does work." A good thing, too, because since its opening in May, the Brandhorst Museum building has been as much of an attraction as the art within. □

The brightly colored façade of the Brandhorst Museum in Munich is made up of square-profile ceramic sticks mounted in front of a folded metal cladding. Before pursuing this design, the architects also considered metal fabric, perforated glass, and a perforated ceramic scrim, all of which were rejected for cost or aesthetic reasons.

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→ ECO

# All Together, Now

## COLLABORATION IS THE KEY TO INNOVATION.

TEXT BY LANCE HOSEY  
ILLUSTRATION BY PETER ARKLE

**MANY CLAIM THAT** the single most important aspect of green building is integrated design, the interactive process of bringing together all the right team members at the right times to address the right questions. This fundamentally differs from the conventional approach, in which the architect first creates a concept and then asks consultants to work with (or around) it, resulting in familiar horror stories about engineers shoehorning equipment into impossibly tight spaces. Truly changing the process means more than just letting more people join the conversation; it demands that architects fundamentally alter their role.

But giving up control goes against everything architects are taught. One of the undying myths of modern architecture is that of the lone creative genius. The most popular expression of this image, of course, remains Ayn Rand's novel *The Fountainhead* (1943), whose protagonist, Howard Roark, famously inspired by Frank Lloyd Wright, is both the hero and villain of architecture. Think about it: Possibly the most enduring

tale about our profession concerns an architect defending his right to dynamite a building because it wasn't built to his specifications. Architecture's most famous literary character is a violent, sociopathic control freak, yet we wonder why our public image is less than warm and fuzzy.

**Can architects learn to play well with others? One way is to "stop thinking like architects,"** says nuclear-engineer-turned-architect Michelle Addington, a Yale professor. Because designers see themselves primarily as authors or artists, Addington explains, they often present a design concept as a done deal. "The value of the work is self-anointed, self-proclaimed," Addington says. "It's going to be heralded, reviled, or ignored, but it's not open to real criticism, the kind of critical evaluation that brings real innovation. There's no rigorous method of design and no shared basis for judging it."

In other fields, however, cooperative intelligence has become essential to innovation. Open-source

programming, in which anyone, anywhere, can tinker with format and content, has made Linux possibly the most elegant computer operating system available. “[U]nder the right circumstances, groups are remarkably intelligent, and are often smarter than the smartest people in them,” writes James Surowiecki in *The Wisdom of Crowds* (2004). “Groups do not need to be dominated by exceptionally intelligent people in order to be smart.” No one knows who invented the igloo, but it definitely wasn’t just one really smart person. A brilliant example of material efficiency, structural integrity, thermal control, and bioregional beauty, the igloo evolved from the collective wisdom of countless Inuits living and learning in one region for untold generations.

Of course, innovation doesn’t just magically happen when a crowd gathers; two heads can be better than one, but only if you put them together well. “No one goes into the process not wanting to collaborate,” Fred Dust says, “but not everyone has the structure to facilitate it.” Dust runs the Smart Space practice at IDEO, the design and innovation consultancy whose diligent process has become the stuff of legend. Its unique brand of collaborative brainstorming created the original Apple mouse and the Palm handheld, among many other landmark products and systems. “Design thinking,” as IDEO calls its approach, “enables us to collectively tackle problems and ideas that are more complex than the lone designer can imagine.”

**Applying design thinking to spaces and environments, Dust’s team finds that the most effective approach is to consider process first and “backfill” content second.** “We have a structure that allows for collaboration and gives us the flexibility to work at any scale.” The best results, he says, occur when designers work directly with clients and customers to develop a concept. “What really excites me is how deep collaboration with clients can break through to new arenas of innovation. Everything we see now shows us that their participation in the process is essential to success.”

Working with Marriott on a concept for its TownePlace Suites extended-stay hotels, IDEO experimented with new methods of rapid prototyping that allowed guests and staff to shape the right environment more quickly than the design team members could have by themselves. Full-scale mock-ups became great design and sales tools and gave the customer a sense of ownership before the hotel was even built. Streamlining the process saved tremendous amounts of transportation energy and construction waste—and cost about one-hundredth of the typical expense, Dust estimates.

Designers need not hold the pencil to create great places. In an inclusive environment that encourages and embraces collaborative innovation, good ideas seep up from anywhere and everywhere, like countless wellsprings feeding a raging river. *The Fountainhead* is dead. Let it rest. □

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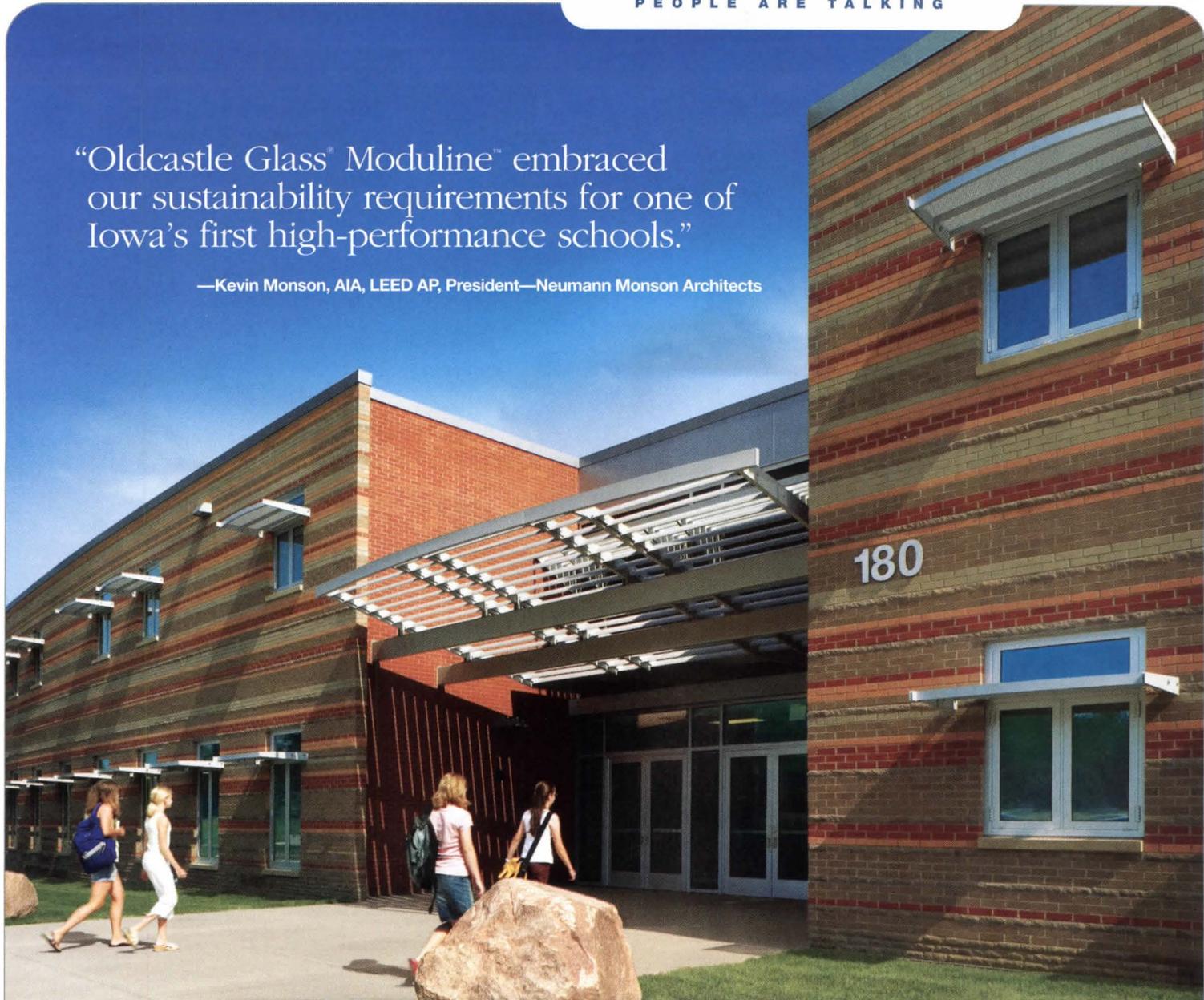
→ PRODUCTS

# Green

TEXT BY KIMBERLY R. GRIFFIN

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—Kevin Monson, AIA, LEED AP, President—Neumann Monson Architects



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Herman Miller's new **Sense** line of modular desking solutions boasts tool-free assembly with components that lock into place using fewer materials. Now available in North America, the desks have a flexible design conducive to a variety of layouts, from free-standing tables to 120-degree clusters. The system meets the company's Design for the Environment protocol, which encourages recycled content and recyclability. • [hermanmiller.com](http://hermanmiller.com) • Circle 103



Available in three styles, the new **bamboo tabletops and countertops** from **Teragren** provide a sustainable surface for retail and hospitality applications. Strand countertops feature a chestnut face with a vertical-grain core (above), while the End-Grain Strand variety is available in wheat or chestnut with a burl-like pattern. Both Strand options are engineered using Xcora technology, making them 154 percent harder than red oak. The Traditional countertop features a vertical-grain face with a bacteria-resistant, formaldehyde-free surface. • [teragren.com](http://teragren.com) • Circle 104

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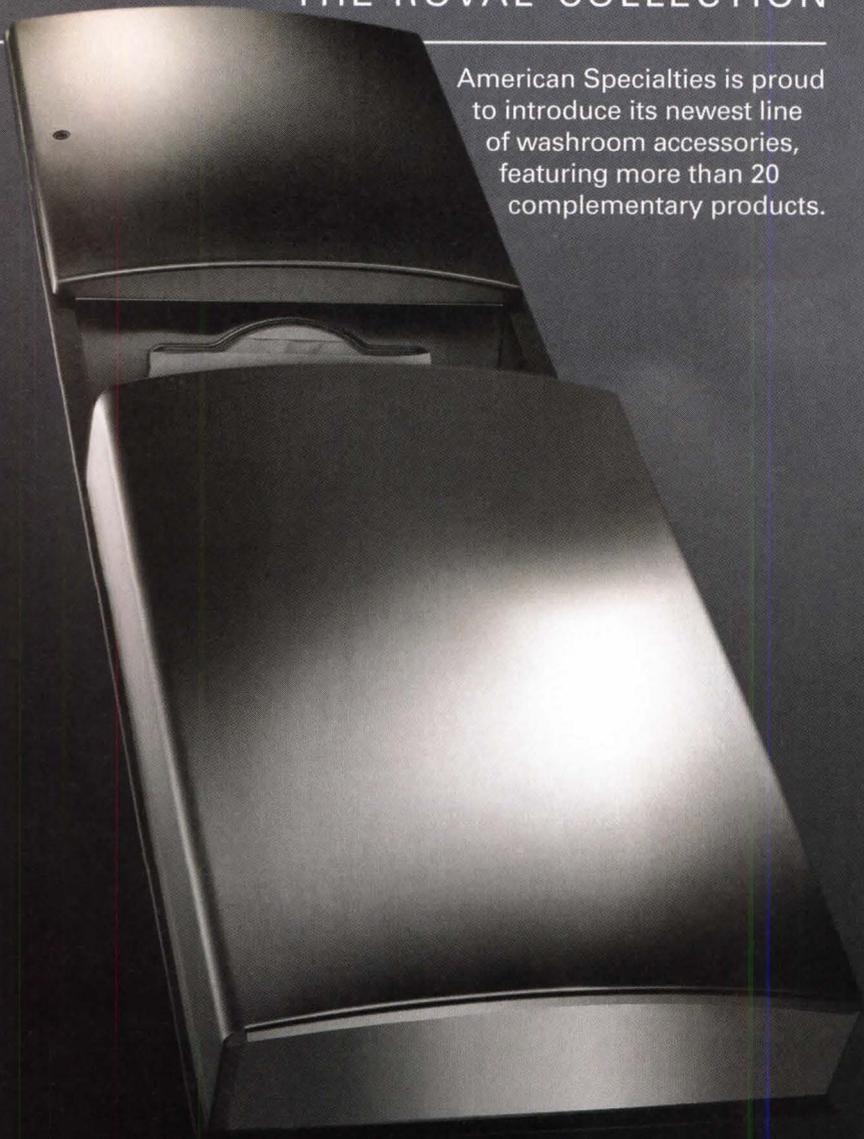
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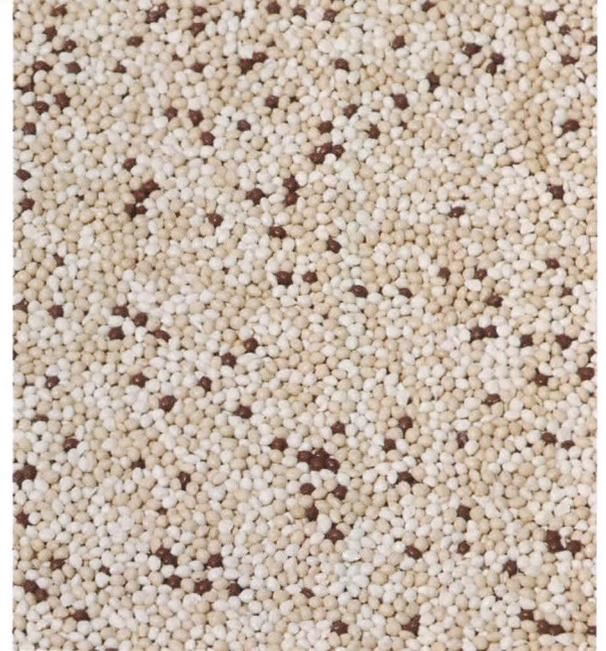
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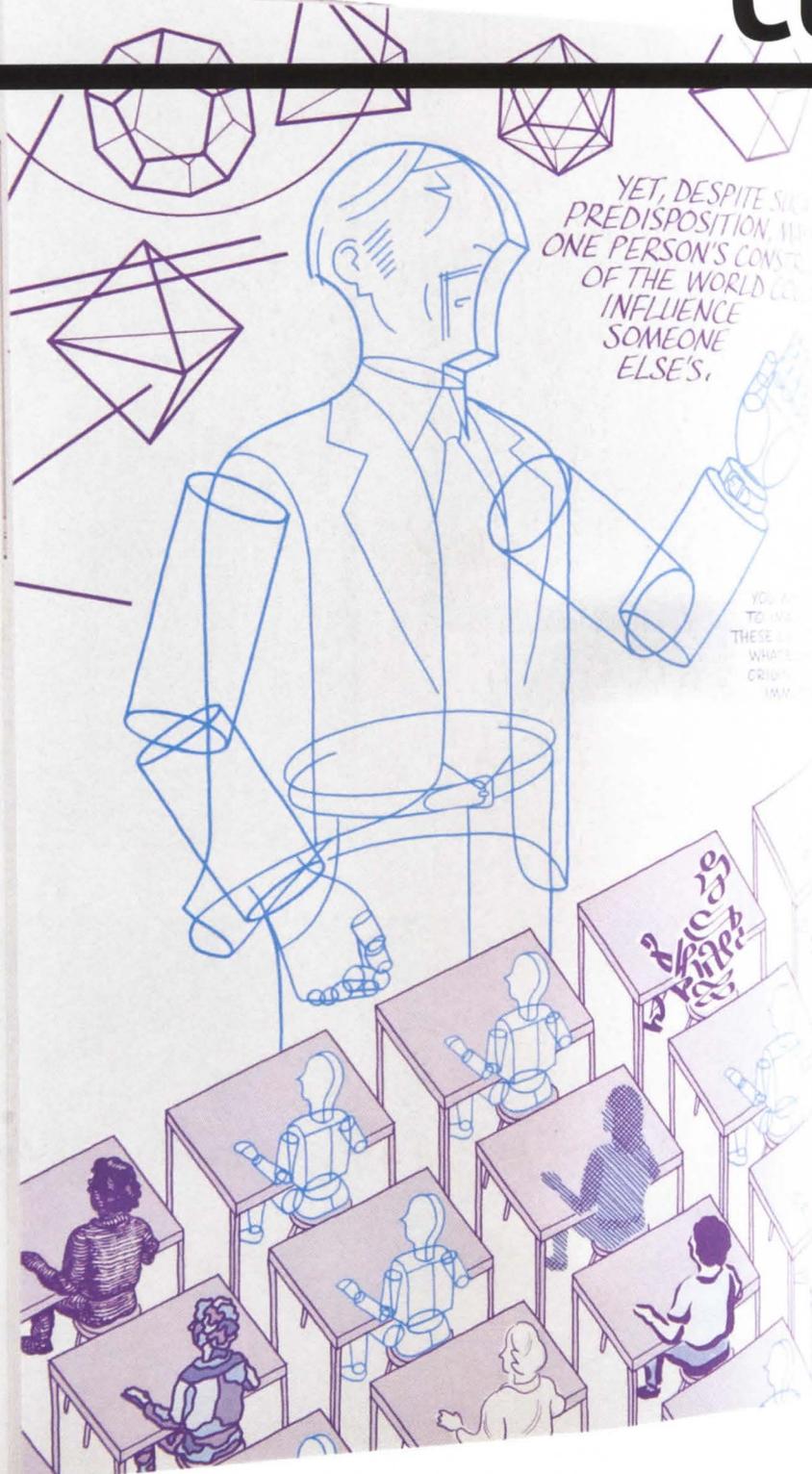
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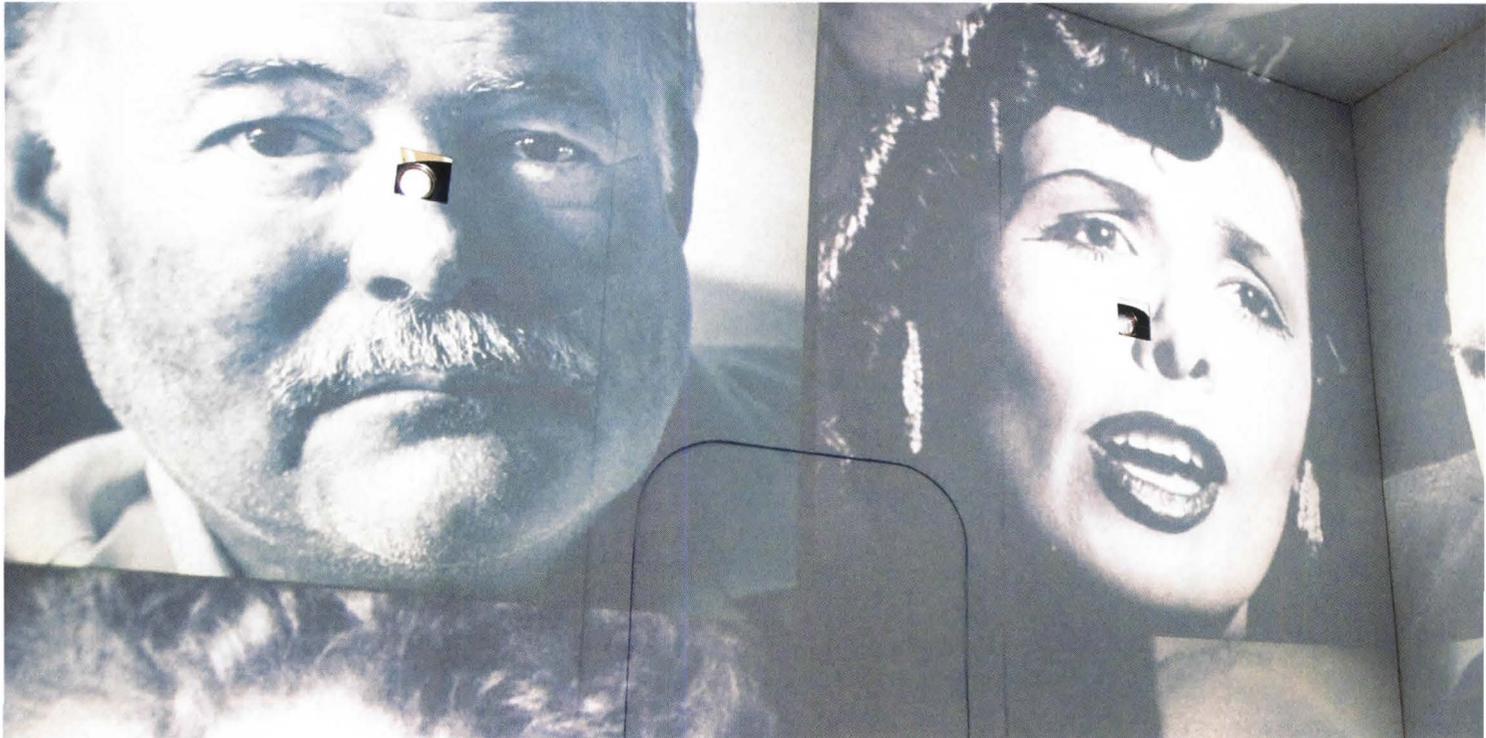
→ **BOOK**

"There are just two things you need to fix here: the interior and the exterior," is the tart advice offered to a student by **Asterios Polyp**, the brilliant, haughty architecture professor who is the namesake of **David Mazzucchelli's new graphic novel**. In deftly rendered comic panels, and with a sharp (but sympathetic) eye for his characters' pretenses and foibles, Mazzucchelli tracks his hero through a midlife crisis in which Polyp re-evaluates his career as a celebrated "paper architect." Visit [architectmagazine.com](http://architectmagazine.com) for a full review. \$29.95; Pantheon



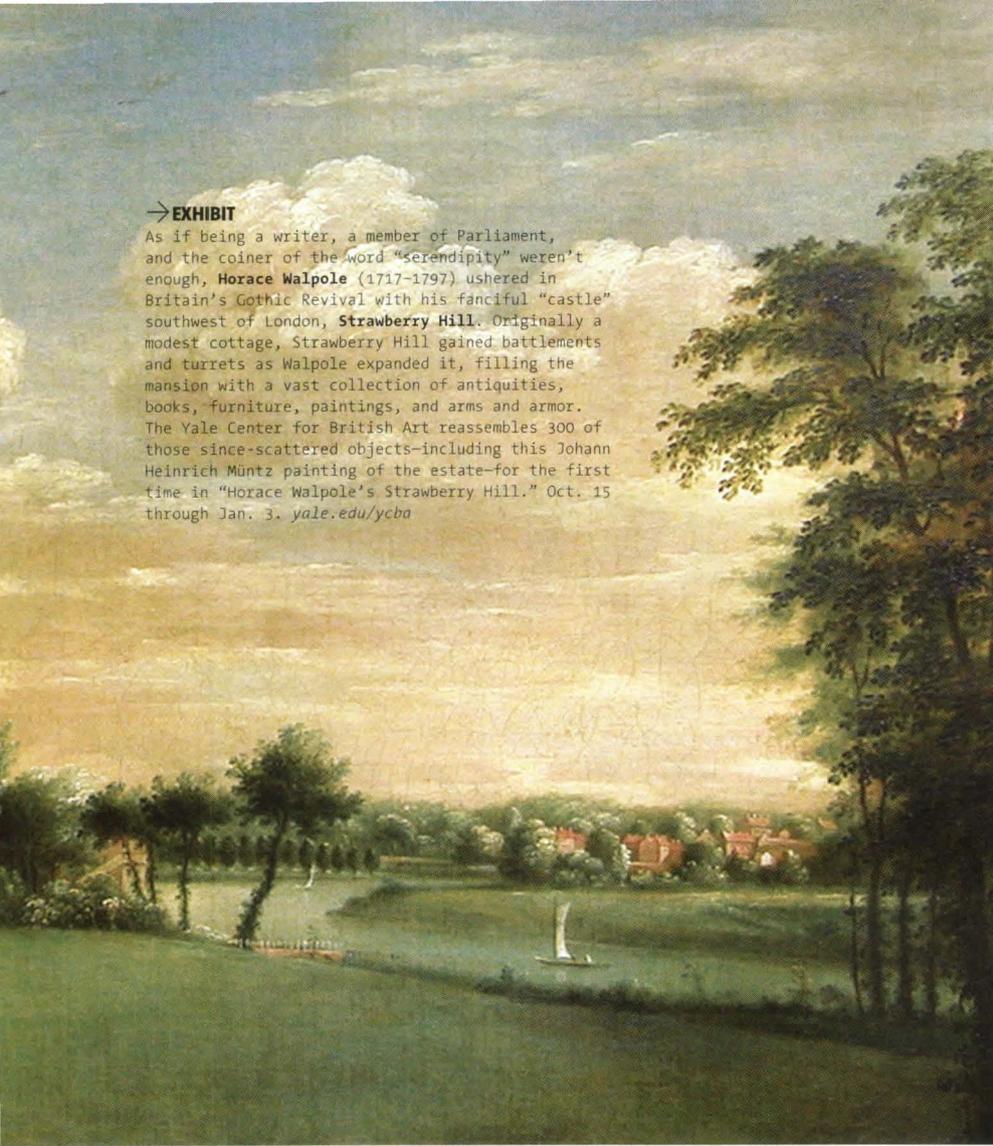
→ EXHIBIT

The Vitra Design Museum is bringing its traveling exhibition “**Marcel Breuer: Design & Architecture**” to Atlanta in partnership with the Museum of Design Atlanta (MODA). Breuer’s most famous furniture designs as well as models of 12 noteworthy projects—including St. Francis de Sales Parish in Muskegon, Mich., and Saint John’s Abbey in Collegeville, Minn.—will be on display in MODA’s galleries and in the Breuer-designed Atlanta-Fulton County Central Library. In a bid to raise awareness about preserving the library (shown above), AIA Atlanta also is organizing a lecture series on the famed architect’s life and influence. Oct. 27 through Jan. 16. [museumofdesign.org](http://museumofdesign.org), [aiaatlanta.org/breuer](http://aiaatlanta.org/breuer)



→EXHIBIT

As if being a writer, a member of Parliament, and the coiner of the word "serendipity" weren't enough, **Horace Walpole** (1717-1797) ushered in Britain's Gothic Revival with his fanciful "castle" southwest of London, **Strawberry Hill**. Originally a modest cottage, Strawberry Hill gained battlements and turrets as Walpole expanded it, filling the mansion with a vast collection of antiquities, books, furniture, paintings, and arms and armor. The Yale Center for British Art reassembles 300 of those since-scattered objects—including this Johann Heinrich Müntz painting of the estate—for the first time in "Horace Walpole's Strawberry Hill." Oct. 15 through Jan. 3. [yale.edu/ycha](http://yale.edu/ycha)



→EXHIBIT

The School of the Art Institute of Chicago and the Mies van der Rohe Society at the Illinois Institute of Technology (IIT) are direct heirs of the Bauhaus pedagogical legacy, thanks to **László Moholy-Nagy's** and **Ludwig Mies van der Rohe's** emigration to the Windy City in the late 1930s. Now the two institutions have joined forces to present "**Learning Modern**," an exhibition of Bauhaus-inflected works by 15 contemporary artists and designers, including Walter Hood, Kay Rosen, and Thom Faulders. Also on display, for the first time in almost half a century: Ken Isaacs' *Knowledge Box* (shown at left), an immersive multimedia cube first built by IIT students in 1962. Through Jan. 9. [livingmodern.org](http://livingmodern.org)

CLOCKWISE FROM TOP LEFT: ARCHITECTURAL PHOTOGRAPHY OF ATLANTA (MARCEL BREUER PAPERS, ARCHIVES OF AMERICAN ART, WASHINGTON, D.C.); COURTESY YALE CENTER FOR BRITISH ART; JAMES PRINZ/COURTESY SCHOOL OF THE ART INSTITUTE OF CHICAGO



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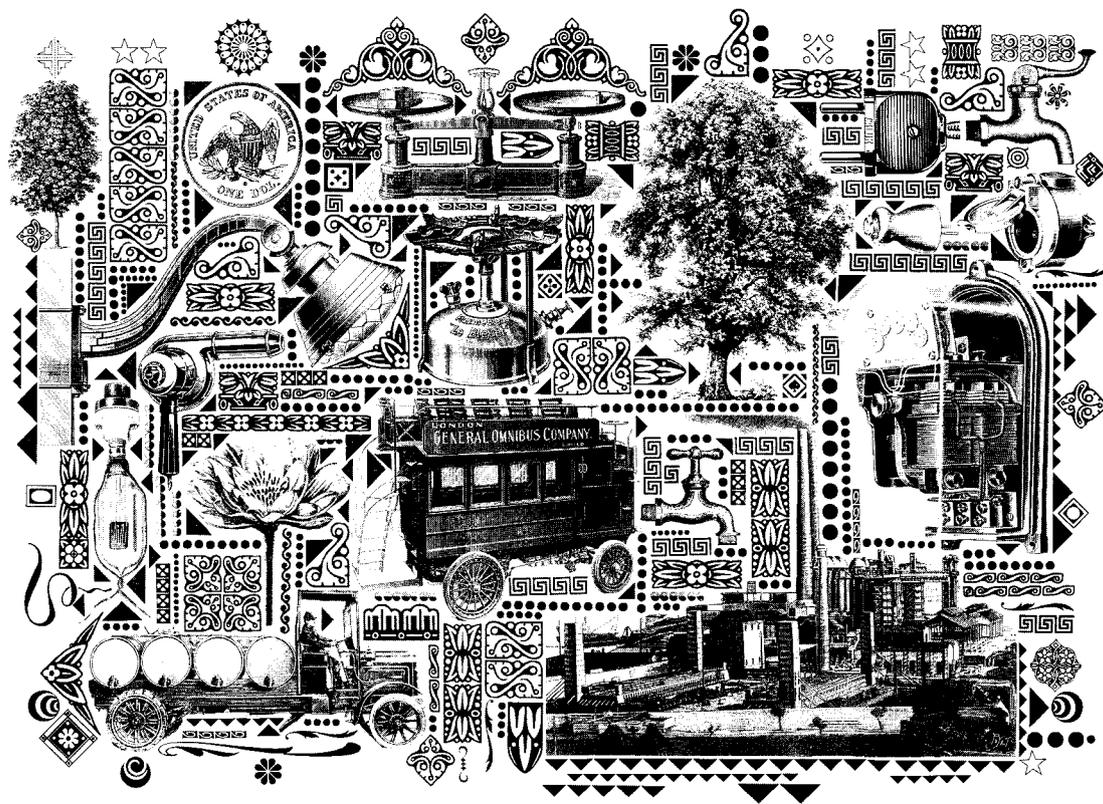
→ CRIT

# Greener By Instinct

TEXT BY ALEX KRIEGER  
ILLUSTRATION BY LORENZO PETRANTONI



**Alex Krieger** is a founding principal of Chan Krieger Sieniewicz, an architecture and urban design firm based in Cambridge, Mass., that focuses on institutional, healthcare, and public projects in complex urban settings. Krieger also is a professor at the Harvard Graduate School of Design, where he has taught since 1977. His many publications include the books *Urban Design* (2009) and *Mapping Boston* (1999). He is a frequent adviser to mayors and their planning staffs and serves on a number of boards and commissions.



NOT JUST THE CONCERN OF GOVERNMENT PANELS AND ACTIVIST GROUPS, SUSTAINABILITY OUGHT TO GUIDE OUR EVERYDAY HOUSEHOLD ROUTINES.

**TO BECOME A CONSERVATION-MINDED PLANET** requires action on the societal scale, such as devising more sustainable patterns of settlement, but also calls for individual awareness of how daily actions impact the environment. While the rhetoric of green is with us, habits are slower to change, as are environmental insights beyond the sound bite.

For example, "Cities are less consumptive than suburbs" is a frequently invoked slogan against our sprawling instincts, but it may not be the best way to

make individuals appreciate how their actions burden resources wherever they may live. Urban advocates are convinced that the carbon footprint of city dwellers, on average, is substantially lower per capita than that of suburbanites—Manhattanites presumably being better stewards of our environment than Long Islanders. Considerable research supports this, yet it remains counterintuitive to many people who, for example,



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see few lights on past midnight in their suburban subdivisions, while Manhattan glows all night long.

And although people in the city no doubt buy fewer lawn mowers, **it is not clear that individual city dwellers consume fewer material goods than others at similar economic levels living on the periphery of cities.** Urban density is more efficient than sprawl, though at its extreme—say in the slums of Caracas or Mumbai—

density is not an indicator of a high quality of life, despite vastly reduced carbon footprints.

Increasingly, we expect wise environmental stewardship from public and corporate leaders, yet we harbor varying intuitions when it comes to the consequences of specific habits and dwelling choices, not to mention hopes for technological ingenuity. Take Masdar, Abu Dhabi's endeavor to build the world's first carbon-neutral city. Its enormous cost is funded by selling more barrels of oil, whose consumers—mostly us—do not for the most part put it to carbon-neutral uses, an irony that tends to go unnoticed as we await Masdar's completion. **Small steps, which cumulatively would eliminate a large share of carbon emissions, are as necessary as grand urban ambitions.**

It's a good idea to replace incandescent light bulbs with compact fluorescent lights, and to turn off lights more frequently and turn them on more reluctantly. The upgrade to better bulbs was made possible by technological ingenuity, as industry devised more efficient lights. But turning these lights on and off more responsibly requires us to modify our habits. In combination, such a one-two punch of product innovation and awareness of use is essential for an ecologically minded future. By contrast is this not-uncommon logic: Purchase a more fuel-efficient vehicle and end up driving more miles, or at least drive as much as before, at less cost. A fuel-efficient vehicle (a social priority) that spends more time in the garage (an individual's decision) would be better still for the environment, urban or suburban.

Some intellectuals are ready to proclaim the gap between conservation and indulgence to be narrowing, and that environmental sustainability and material consumption are no longer at odds. The evidence for this is slim. **Affluence still seems to produce an abundance of effluence.** Can an affluent culture become less consumptive or learn to consume mostly "green" things? This is not a trivial question: More stuff generally requires more energy to produce, and in turn produces more waste. While society will mandate energy conservation and recycling innovations, reducing consumption at the household scale would be helpful, too. Again, greater reciprocity between individual action and cumulative societal impact would lead to more sustainable settlements.

To this end, individuals should be asking themselves questions such as: Does my morning's extra-long hot shower have some relationship to ecological urbanism? One carbon footprint—lowering initiative for both city folks and suburbanites would be to shut off water heaters regularly. Consider the impact of 100 million American households, each maintaining 60 to 100 gallons (or more) of hot water constantly. How many of us even think of turning the switch off prior to a weekend escape?

Society will demand and produce more efficient water heaters; maybe those heaters will even turn themselves on and off. But quicker showers using less hot water on occasion would further help the environment. This is not a call for sloppier personal hygiene or for denying the pleasures of a hot shower. It is a reminder that individual decisions are as important to an ecological urbanism as greener master plans. □

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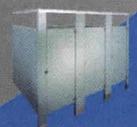
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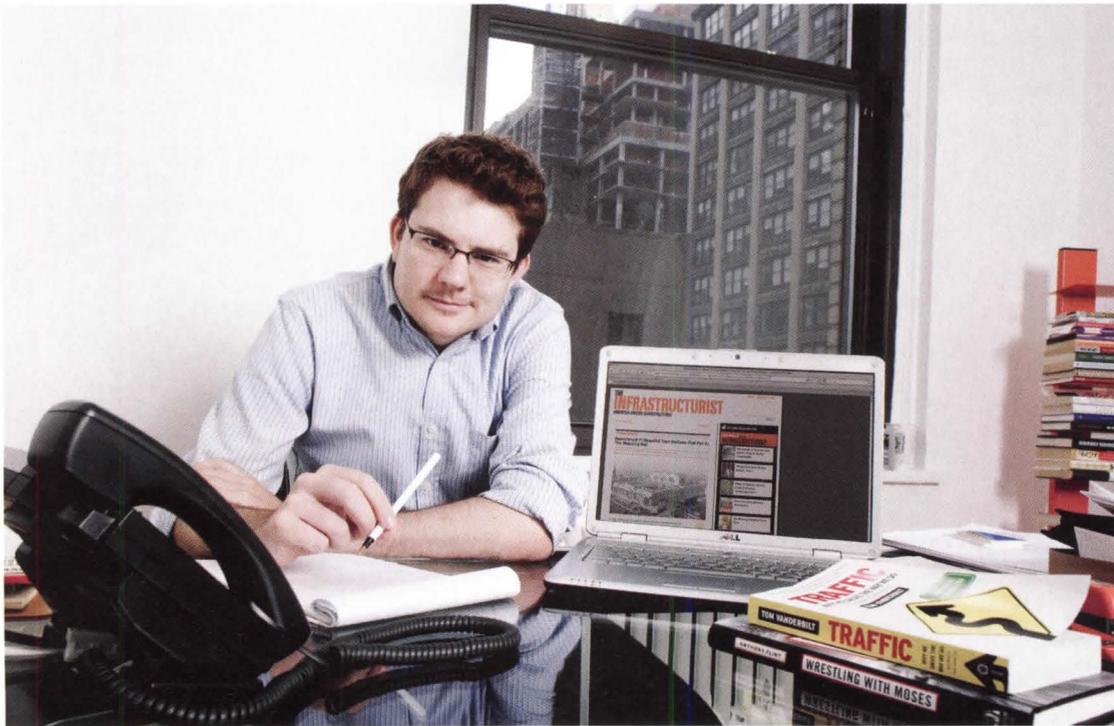
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→ SCREEN GRAB

# infrastructurist.com

KEEPING TRACK OF INFRASTRUCTURE ISSUES AND DEVELOPMENTS IN THE U.S., FROM CAPITOL HILL TO MAIN STREET.



TEXT BY MIMI ZEIGER  
PHOTO BY NOAH KALINA

Launched during Capitol Hill's debate over the multibillion-dollar stimulus package, *The Infrastructurist* both reflects and informs a nation grappling with the opportunities presented by the American Recovery and Reinvestment Act. "We don't often have a chance to put in place a foundational set of structures," says editor **Jebediah Reed**.

**THE INFRASTRUCTURIST** wasn't exactly "shovel-ready" last winter, when Congress was debating the finer points of what would become the American Recovery and Reinvestment Act, but it sure was close. In February, the stimulus package became law—putting the country's long-neglected bridges, highways, and transportation systems center stage—and the blog, a clearinghouse for all things infrastructure, launched the same month, just weeks after its conception. Publishers Alexander Jutkowitz and Mitch Stoller, who also run the media firm Group SJR, asked journalist **Jebediah Reed** to take the reins. Under his guidance, the site has grown quickly and steadily, getting nearly 150,000 unique visitors in August.

"We wanted to create a place with some personality, where people can engage in the discussion of what kinds of structures we should be reimagining for our country's cities and transportation networks," explains Reed. Formerly on the politics and media beat at *Radar* magazine, Reed has a knack for decoding the technical snarls and murky policy that come with infrastructure territory. For architects and urban planners, the site is a clear-eyed, easy-to-read resource.

Interviews on the site—including chats with Brookings Institution fellow and *The Option of Urbanism* author Christopher Leinberger, Zipcar co-founder Robin Chase, and former Massachusetts governor Michael Dukakis—are surprisingly optimistic in a grim economy. Transportation Secretary Ray LaHood tops *The Infrastructurist's* list of dream interviewees, of course, but for the moment Reed is happy that LaHood follows the blog's Twitter feed.

While the site steers clear of ideology, Reed doesn't hide his support of certain causes—like high-speed rail. "[It's] a defining issue for how Americans think about cities and how our cities will evolve in the next century," he says. "I get excited thinking about what could be if we do it right." □

## LINKS

### [theopolisblog.blogspot.com](http://theopolisblog.blogspot.com)

The urban-minded *Where* blog ended its run in August, but contributors Katia Savchuk and Peter Sigrist have continued the global discussion of cities at *Polis*, with the help of 10 other correspondents.

### [artfagcity.com](http://artfagcity.com)

Montreal artist Jon Rafman contributes to *Art Fag City's* IMG MGMT essay series with "The Nine Eyes of Google," a meditation on the company's "endless quest to photograph every highway and byway in the free world." What does Rafman learn from his yearlong dive into Street View images? "The collections ... both celebrate and critique the current world," but it is up to us to "make sense of Google's record of our experience, for good or for ill." • [bit.ly/2Pct6D](http://bit.ly/2Pct6D)

### [artbabble.org](http://artbabble.org)

Launched by the Indianapolis Museum of Art in April—and now featuring content from 18 partner institutions—*ArtBabble* showcases hi-res video art, video interviews with artists, video documentaries about art ... in other words, it's all about crystal-clear moving images of art. Because life is too short to have to experience beauty through shoddy YouTube fare.

### [agilitynut.com/roadside.html](http://agilitynut.com/roadside.html)

"I have been passionate about commercial architecture and roadside-related things all my life," writes Debra Jane Seltzer in the description of her photo-rich website *Roadside Architecture*. "Passionate" may be too mild a word: In nearly 30,000 images gathered over many years, Seltzer has documented the American built environment in all its glorious forms, from the highbrow (Art Deco edifices), to the everyday (dinners, motels, mini-golf courses), to the simply curious (giant statuary of people and animals; buildings shaped like bottles, fruit, and other nontraditional forms).

### [graduatedegree.org/blog](http://graduatedegree.org/blog)

The blog for a site billing itself as the "ultimate source for getting an online graduate degree" petered out after only a few months earlier this year, but it did generate one worthwhile post: 100 Flickr collections for architecture buffs. • [bit.ly/uUCL](http://bit.ly/uUCL)

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**Graniterra**  
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**Innovative Surfaces, Inc.**  
Hastings, MN  
innovativesurfaces.com

**Johnson Granite**  
Mount Airy, NC  
johnsongraniteinc.com

**Malisani, Inc.**  
Great Falls, MT  
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**Marble Emporium**  
Northbrook, IL  
marbleemporium.com

**MARBLEX**  
Fairfax, VA  
marblexinc.com

**NBC Solid Surfaces**  
Springfield, VT  
nbcsolidsurfaces.com

**Northstar Granite Tops**  
Maple Lake, MN  
northstargranitetops.com

**Premier Surfaces**  
Alpharetta, GA  
premier-surfaces.com

**Quality Granite & Marble, Inc.**  
Wichita, KS  
qualitygraniteandmarble.com

**Radtke Tile & Marble**  
Carson City, NV  
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**RICON, Inc.**  
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**Rocky Mountain Stone**  
Albuquerque, NM  
rockymountainstoneinc.com

**Rozelle Stone Company**  
Easley, SC  
rozellestone.com

**Rugo Stone**  
Lorton, VA  
rugostone.com

**SolidTops**  
Easton, MD  
solidtops.com

**Stone Interiors**  
Loxley, AL  
stoneinteriors.com

**Stone Interiors East**  
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**Surface Products**  
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Redford, MI  
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# **SURPRISING SHADES OF**



# THINK EVERY ARCHITECT IS ON BOARD TO FIGHT GLOBAL WARMING? THINK AGAIN.

**A FEW YEARS AGO**, the debate in the media and in academia over global warming took a different turn: It stopped being, well, much of a debate. In early 2007, the United Nations' Intergovernmental Panel on Climate Change reported that human activity was, with a likelihood above 90 percent, the main cause of rising temperatures. Just this year, a poll by two scientists indicated that 97.4 percent of climatologists believe human activity has driven global temperature changes. Clashes of opinion on this issue among experts, concluded pollsters Peter Doran and Maggie Kendall Zimmerman, are now "largely nonexistent."

And yet: According to a recent Gallup poll, only 58 percent of the general public is convinced that global warming is caused by man, which means that nearly half of us remain skeptical. We at ARCHITECT figured that, even as the profession espouses the mantra of sustainability, and despite the prominence of climate change—battling organizations like Architecture 2030, there must be some naysayers out there. Right?

In fact, we found more than we anticipated. Turn the page and see for yourself: 33 percent of the 960

design professionals we surveyed this summer said skepticism about climate change was "common" in their professional network, while nearly 13 percent answered that global warming was "a myth."

Surprised, we ran the results by two architect-activists, Edward Mazria of Architecture 2030 and Alexis Karolides of the Rocky Mountain Institute. Mazria took a decidedly glass-half-full view. "That over 70 percent of respondents are committed to or willing to build sustainable buildings is an incredible shift from just a couple of years ago," he commented by e-mail.

What about the architects who think global warming is a hoax—could too much talk about climate change turn them *off* green building? Mazria doesn't think so: "Those few ... risk missing out on one of the greatest economic opportunities in recent history."

Karolides points out that architects are hardwired to value efficiency in design, irrespective of their beliefs about global warming. Also, she notes, the issue might catalyze as many architects as it turns off, imparting urgency to the sustainable agenda. "It gets people motivated to do something," she says. Let's hope so.



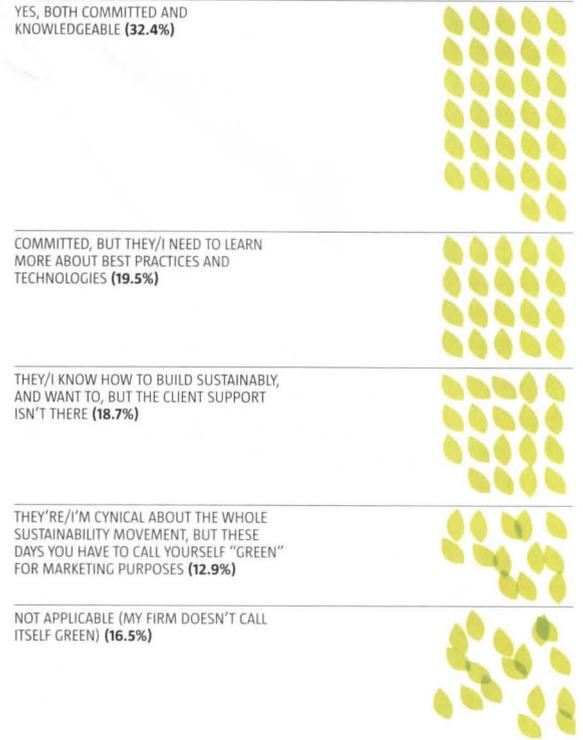
### 1. GREEN INC. ...

Does your firm represent itself to clients as being committed to green or sustainable design? If you're a solo practitioner, do you represent your own services this way?



### 2. ... OR GREENWASH INC.?

If your firm calls itself "green," do you believe that the firm's leaders are truly committed to, and knowledgeable about, green building? If you're a solo practitioner, would you describe yourself as such?



**“SUSTAIN  
IS GREAT  
CHANGE**

### LOCATION OF RESPONDENTS\*



### 3. OLIVE, FOREST, JADE, LIME

Which of the following most closely describes your personal views on sustainable design and the environment?

GLOBAL WARMING IS A MYTH PERPETUATED BY THE MEDIA, AND GREEN BUILDING IS A FAD — IT'LL BE FORGOTTEN IN 20 YEARS' TIME.

12.8%

I'M NOT SURE WHETHER BUILDING GREEN IN THE U.S. WILL HELP THE ENVIRONMENT WHEN CHINA AND INDIA ARE BECOMING INDUSTRIALIZED SO RAPIDLY.

6.7%

I'M NOT SURE THAT GLOBAL WARMING IS CAUSED BY MAN, BUT ENERGY CONSERVATION MAKES ECONOMIC SENSE IF WE'LL BE LESS DEPENDENT ON OTHER COUNTRIES' OIL.

34.1%

IT'S VITAL THAT WE DESIGN AND BUILD SUSTAINABLY, IN ORDER TO CONSERVE SCARCE RESOURCES AND PREVENT FURTHER GLOBAL WARMING.

46.4%

ABLE DESIGN  
CLIMATE  
S A MYTH.”

— RESPONDENT 104



FLORIDA (32)



GEORGIA (19)



HAWAII (8)



IDAHO (2)

ILLINOIS (36)



INDIANA (7)



IOWA (5)



KANSAS (11)



KENTUCKY (5)



LOUISIANA (3)



MAINE (0)

# “CLIMATE CHANGE IS THE MOST PRESSING THREAT ON EARTH.”

— RESPONDENT 236

## 4. YOUR NETWORK

Do you know of any colleagues—or other design-firm professionals—who don't believe that climate change is a major problem and/or don't believe that it's caused by human activity?



YES (71%)



NO (29%)

## 5. YOUR FRIENDS: AL GORE OR GLENN BECK?

How common or uncommon is climate-change skepticism within your professional network?



MARYLAND (16)



MASSACHUSETTS (15)



MICHIGAN (10)



MINNESOTA (16)



MISSISSIPPI (1)



MISSOURI (15)



MONTANA (1)



NEBRASKA (5)



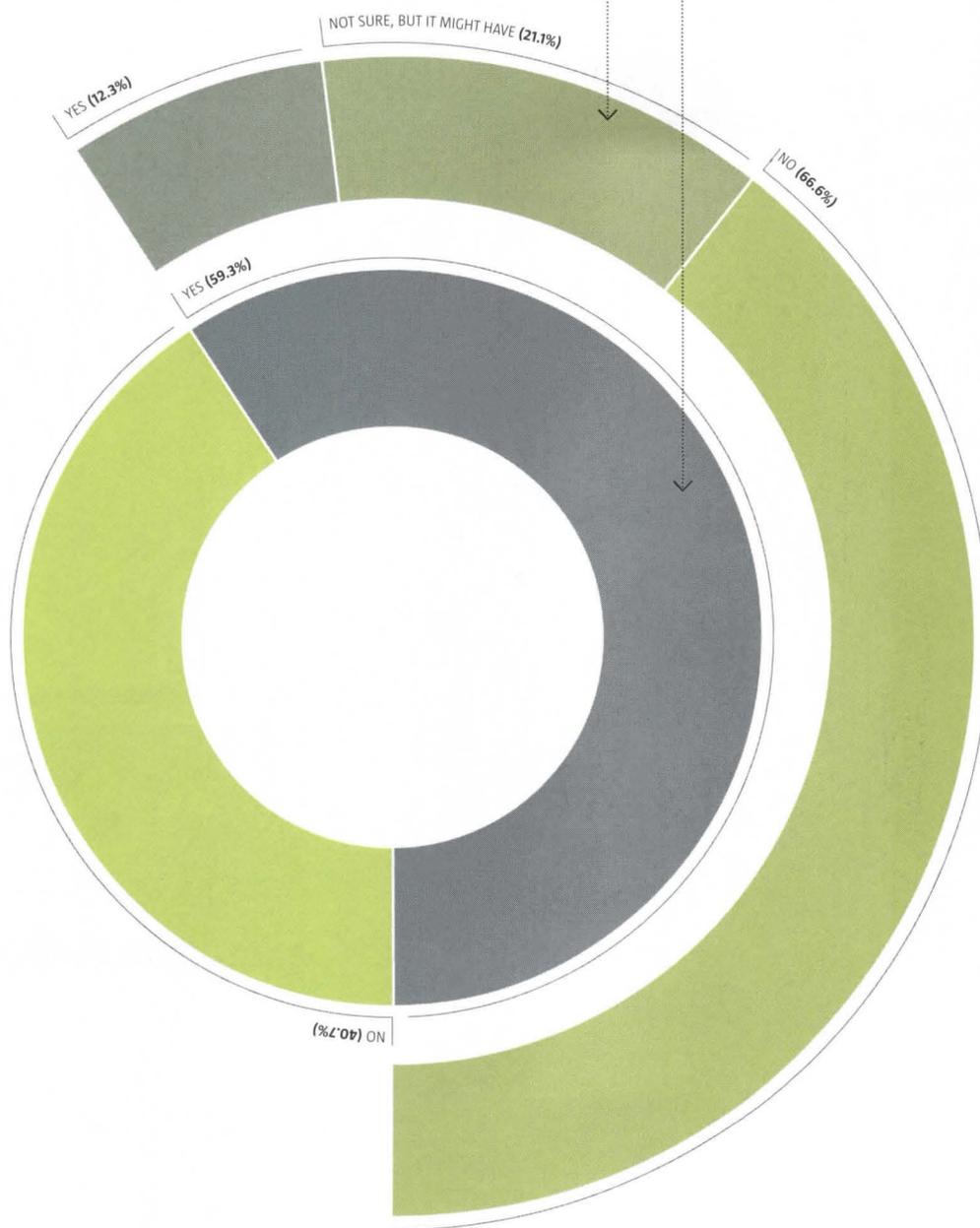
NEVADA (1)



NEW HAMPSHIRE (1)

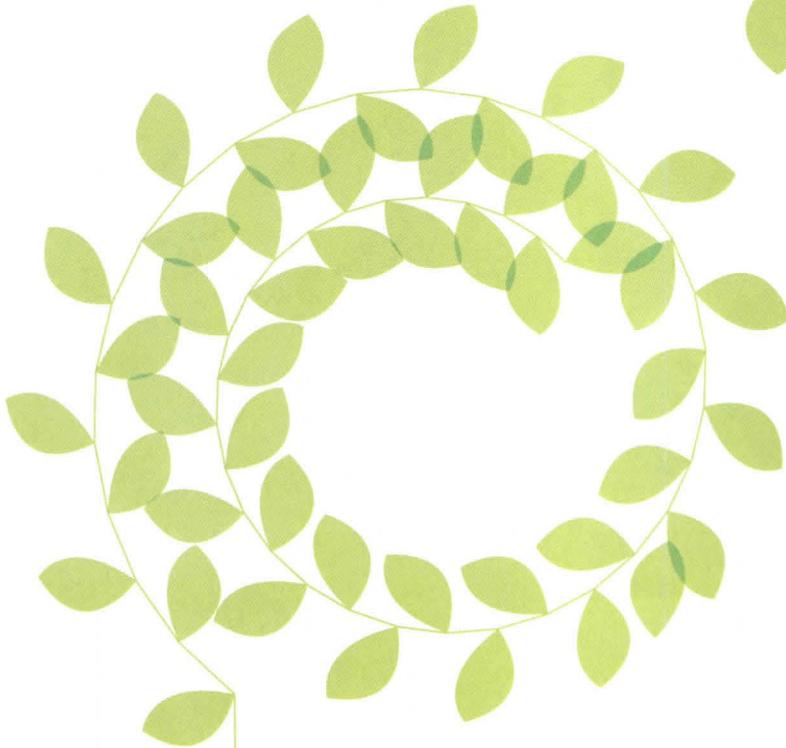
## 6 & 7. WORKING WITH THE OPPOSITION

Have you ever been on a project team with someone whose views on climate change and the environment were opposed to your own? If you answered "yes" to that, did this difference of opinion affect your working relationship and your ability to complete the project to a high standard?



### 8. BLUE LANGUAGE RE: GREEN

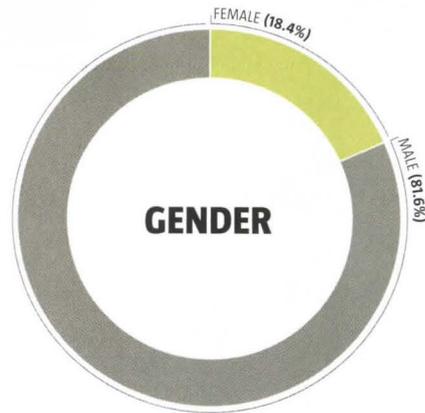
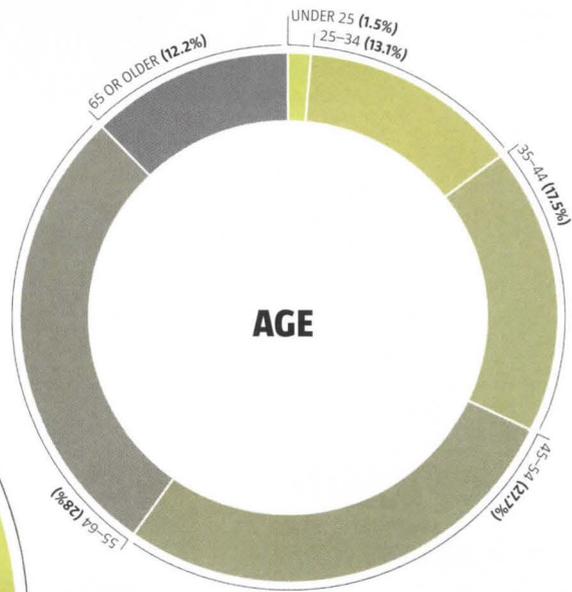
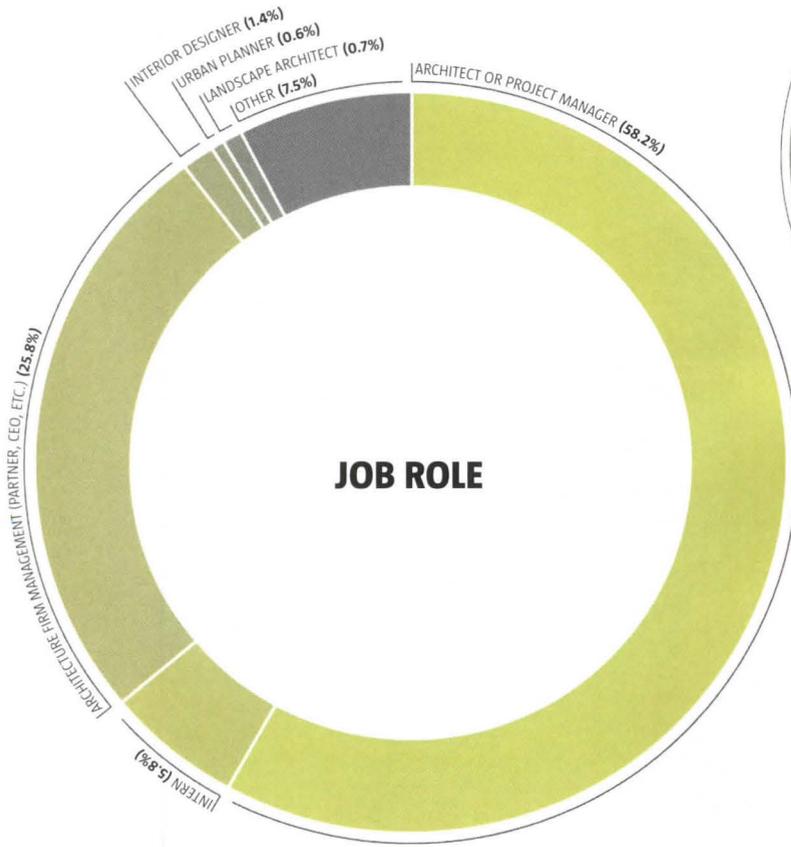
Have you ever argued with colleagues about sustainable design and its impact on the environment or tried to win them over to your point of view?



**“CORPORATE  
SITES USE  
WHY DO  
INSULATE**



# THE RESPONDENTS ...



**"GENERATIONS LEAVE OLD  
SUSTAINABLE, SO  
NEED TO D\*\*K WITH  
ON?"** — RESPONDENT 97



WASHINGTON (18)

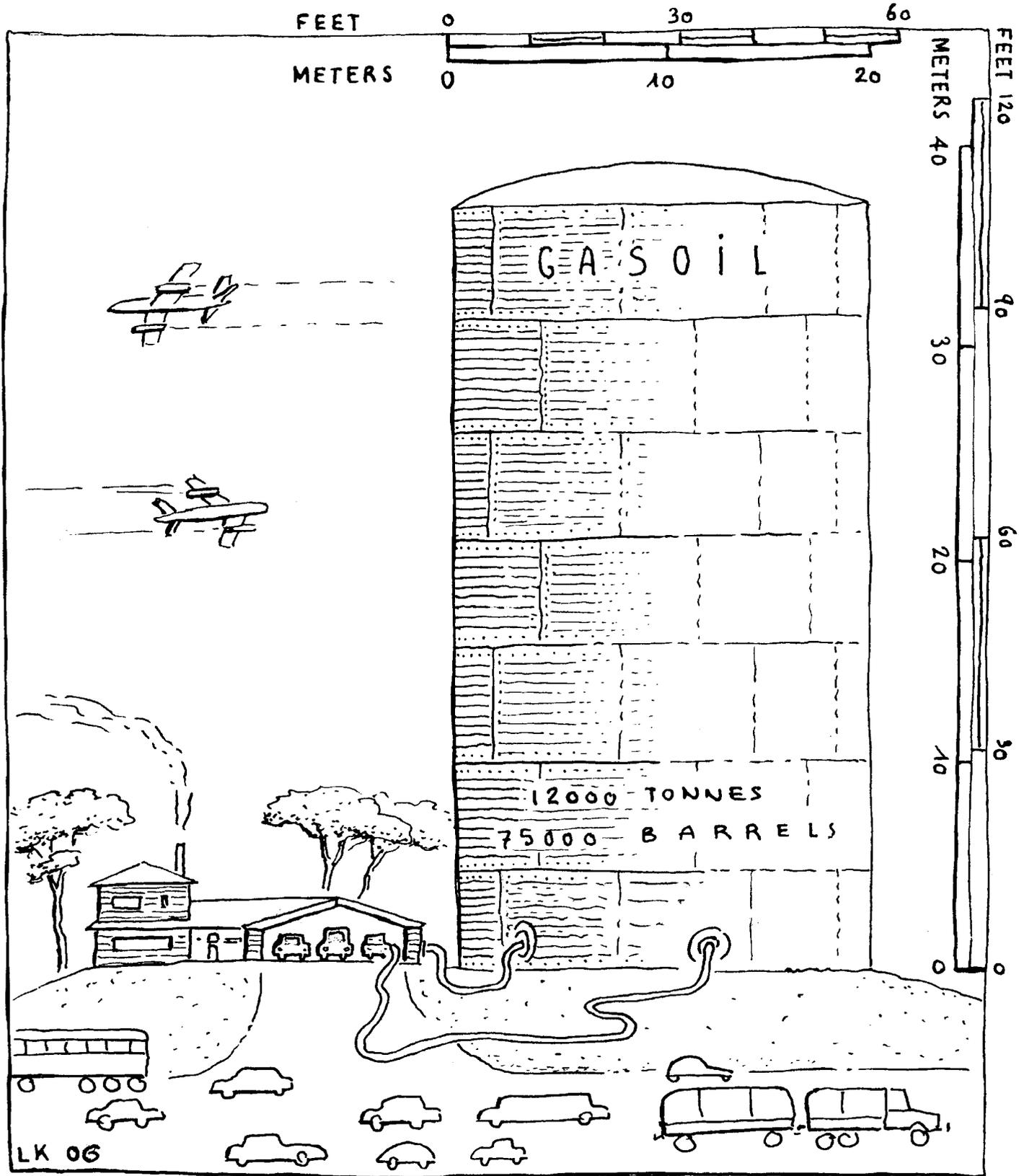


WISCONSIN (12)

WYOMING (0)

WEST VIRGINIA (0)

\* RESPONDENTS WERE ABLE TO SKIP QUESTIONS; THIS BREAKDOWN IS BASED ON 555 RESPONSES.



**US-HOUSEHOLD OF 4p. ~ OIL CONSUMPTION per CENTURY**  
 1 BARREL = 159 LITERS = 35 GALLONS ☆ 1 TONNE = 6.3 BARRELS

LK 06

IN HIS LATEST BOOK,  
ARCHITECT AND  
PLANNER **LÉON KRIER**,  
GODFATHER OF THE NEW  
URBANISM, ARGUES  
THAT TRADITIONAL  
EQUALS SUSTAINABLE.

## RIGHT KRIER, RIGHT NOW

**DURING THE 1980S AND '90S**, much of what counted as deep thought in architecture amounted to a war for mind- and marketshare between postmodernists like Peter Eisenman and neotraditionalists like Léon Krier. Over the years, the neo-trads won the mass residential market with their comfort-food approach to style and planning, while the pomos captured the bastions of academia and high culture with complex digital forms and post-structuralist theories.

Like Eisenman, Krier is more famous as a provocateur than as a builder; the sketch is his sword, and it seldom fails to prick. Krier's latest book, the pocket-sized *Drawing for Architecture* (MIT Press; \$24.95), reproduces some of his most famous doodles from past decades: scathingly funny swipes at the architectural avant-garde, passion

pleas for human-scale urbanism, and alarming attempts to restore the reputation of Nazi classicist Albert Speer.

*Drawing for Architecture* would be a mere greatest-hits collection except that Krier includes several new drawings in support of energy conservation and environmental stewardship, along with a foreword by peak oil agitator James Howard Kunstler. Now that the profession has set aside the style wars of past decades and taken up sustainability for the future, Krier obviously is proclaiming, like a latter-day Constantine, his own conversion to the green: *In hoc signo vinces*. It's less obvious whether Krier's new faith is true, or just politically expedient. □

→ Visit [architectmagazine.com](http://architectmagazine.com) to see more of Krier's drawings.

# FOUNDA

TAMING THE ECONOMIC, ENVIRONMENTAL, AND GEOPOLITICAL COST OF ENERGY HAS EMERGED AS A NATIONAL IMPERATIVE. SO **WHY ARE RESEARCH DOLLARS FOR BUILDING PERFORMANCE SO SCARCE?**

# W ATION

TEXT BY ELIZABETH EVITTS DICKINSON

**WHEN MCKINSEY & CO.**, a global management consulting firm, released a report on energy efficiency in July, it caused quite a stir among building science researchers. Called "Unlocking Energy Efficiency in the U.S. Economy," the report concluded that an upfront investment of \$520 billion in efficiency measures could shrink this country's non-transportation energy consumption in the next decade by 23 percent, or \$1.2 trillion. That's a considerable return on investment.

There is, of course, a catch. To realize such savings, the United States would need to rally around a national agenda. "Energy efficiency offers a vast, low-cost energy resource for the U.S. economy—but only if the nation can craft a comprehensive and innovative approach to unlock it," the report states.

When it comes to building science research in this country—including everything from seismic and safety issues, to materiality and performance, to indoor air quality and moisture—we don't do "comprehensive." American building science research is, at best, piecemeal; at worst, it's barely funded. There is no federal agency that spearheads research endeavors, and no dedicated funding stream that supports scientists. The building industry itself—architecture, engineering, manufacturing, construction, and maintenance—is a \$1-trillion-per-year business employing some 1.7 million people, but it simply does not invest in R&D the way that, say,

The average annual funding of green building research by the National Science Foundation from 2003 to 2005

The NSF's overall 2009 budget

# \$23,000 out of \$6,490

pharmaceutical companies do. The building sector spends one-tenth as much on R&D as the national average for other industries, according to Mark Frankel, technical director of the nonprofit New Buildings Institute (NBI).

The McKinsey findings resonated with building science researchers for a number of reasons, not the least of which is that buildings represent our nation's biggest energy sink. The same month that McKinsey released its report, Drury Crawley of the U.S. Department of Energy's (DOE) Building Technologies Program sat before the House of Representatives to make the case for R&D into energy-efficient building. In 2008, he explained, the nation's 114 million households and more than 74 billion square feet of commercial floor space accounted for nearly 40 percent of primary energy consumption and 39 percent of carbon dioxide emissions. The total energy bill amounted to \$418 billion. The message was clear: If we want to reverse this tide, we had better support the scientific research of buildings.

So how much money is invested annually in building science research in the U.S., and what, exactly, is being funded? It seems like a simple enough question until you start digging. Since there is no one government agency driving a building science agenda, no national clearinghouse, you must look to the myriad public and private agencies conducting applied and academic research. This work is scattered among national laboratories, a few private companies and utilities, industry-academic coalitions, and a handful of university research centers run by faculty and students.

The National Science Foundation (NSF) seems a logical place to start this quest for numbers. With an annual budget of more than \$6 billion, the NSF is the funding source for 20 percent of all federally supported research at American colleges and universities. Turns out, however, that building science isn't a line item in the NSF budget. "The National Science Foundation funds fundamental research and education across a wide range of ... areas; however, NSF funding generally does not focus on application areas. As a result, it's very difficult to assign specific funding levels to application areas such as building sciences," explains Joshua Chamot, NSF's media officer for engineering and chemistry.

This may help explain why so few universities include building science research in their curricula. "I have been decrying this condition in Washington in every venue I'm given," says Vivian Loftness, a professor at Carnegie Mellon University's School of Architecture and the director of its Center for Building Performance and Diagnostics. **"What it's doing is starving the schools of any sustained dollars that would ensure tenure, ongoing Ph.D. programs, and research. Without these resources, the number of building scientists that graduate every year is probably under 100."**

Edward Arens, a professor of architecture at the University of California, Berkeley, runs a building science research program through the school's Center for the Built Environment. He has dedicated his professional career to research and says it has been difficult to attract new talent because funding is so sporadic. "People I work

with got into this in the Carter administration, and we've been holding on by our fingernails ever since," Arens says. "There's a whole generation of missing people who didn't come into this field. We simply couldn't attract them."

Without sustained funding, it's hard to keep university programs running. "We simply do not have enough sources for endowment," says Deane Evans, executive director of the Center for Architecture and Building Science Research at New Jersey Institute of Technology. **"NSF should have building science as a priority, but they don't believe in building science."**

The federal funding that does exist for building science research is increasingly being funneled into high-performance buildings. The DOE has emerged as the governmental fountainhead, with \$140 million of its \$25 billion budget going toward building research this year. A portion of that \$140 million supports partnerships with industry and other governmental agencies; another slice funds research at the DOE's national laboratories.

Other government agencies invest modest amounts into research, such as the U.S. General Services Administration (GSA), which provides workspace for more than 1 million federal employees. Its budget has vacillated from \$2 million to \$8 million in recent years (current fiscal year numbers are not available). The National Institute of Standards and Technology (NIST), a federal agency within the Department of Commerce, includes the Building and Fire Research Laboratory, which got \$30 million this year for research into fire, materials, seismic and disaster scenarios, and high performance.

## WHO'S GOT WHAT LITTLE FUNDING THERE IS?

**Department of Energy:** Total fiscal 2009 budget: \$25 billion. Last year, \$140 million was allocated for building science research. In addition, the DOE will receive a one-time infusion of \$346 million from the stimulus act for research into energy-efficient buildings. • **National Institute of Standards and Technology:** Total budget this year: \$819 million; budget for building science research: \$30 million (plus a \$23 million stimulus bump). • **General Services Administration:** \$2 million to \$8 million per year. • **U.S. Green Building Council:** Put \$2 million into a green building research fund in 2008 and has committed to an additional \$1 million. • **University of California, Berkeley, Center for Environmental Design Research:** About \$1.5 million per year. • **New Buildings Institute:** Total annual budget: about \$4 million; research budget: about \$1.3 million. • **New Jersey Institute of Technology:** \$800,000 to \$1 million per year. • **Carnegie Mellon University:** \$500,000 to \$1 million per year. • **Massachusetts Institute of Technology:** \$500,000 per year.



The federal dollars going to building science research amount to a minimal percentage of the overall research budget. In 2007, the U.S. Green Building Council released a report on green building research funding, which found that, from 2002 to 2004, green building research accounted for approximately 0.2 percent of all federally funded research, despite the fact that the construction industry represented 9 percent of the nation's GDP during that time.

Besides the feds and universities, there are a handful of nonprofit organizations, such as the NBI, that dedicate a portion of their funds to applied research. Most, however, fund the dissemination of findings and not the research itself. The National Institute of Building Sciences (NIBS), for example, has an annual budget of \$8.5 million, most of which goes to applications. "We take the research that has already been done and then figure out how to apply it to standards and codes," explains Gretchen Hesbacher, director of communications for NIBS.

What about the building industry itself, and that paltry R&D percentage? Loftness wishes manufacturers of building products would up their investment in R&D, to be on par with the IT industry. Companies like Google, she points out, "are [not only] getting good research at an affordable price, they are creating a new generation of thinkers in their field. We are not doing that in the building sector." Then again, the fragmented nature of the industry may be largely to blame. "There are a lot of small players," says the NBI's Frankel. "It's hard for one player to generate the research, so it tends to fall to the feds and other agencies."

The feds, however, have no national building agenda or sustained sources for financial support. **Tracked over time, funding for building science research in the U.S. begins to look like a mountain range: a series of peaks and valleys, with the peaks usually attributable to a calamity or an urgent need.** It evidently takes a crisis for the U.S. to invest in research.

For instance, the Building Research Council at the University of Illinois at Urbana-Champaign came about in 1944 because President Franklin D. Roosevelt supplied resources to create low-cost housing for returning soldiers. Likewise, NIBS was founded during the energy crises of the 1970s, when President Jimmy Carter encouraged investment in new technologies such as solar. That funding died in the Reagan years and never fully recovered.

Compare what we're doing with what other countries are doing. Germany's public-private Fraunhofer-Gesellschaft supports all kinds of research through 60 institutes around Germany (and more research centers elsewhere), and it places a high priority on building science research. In 2007, Fraunhofer spent 200 million euros (\$295 million) on materials research alone—that's more than the annual building research budgets of the DOE, the NIST, and the GSA put together.

Asian countries are now attracting top researchers from the U.S. "We are way behind the Europeans and the Japanese, and we are now moving behind the Chinese. We're losing ground pretty quickly," Loftness says.

John E. Fernandez, a faculty member of the Building Technology Program in MIT's Department of Architecture, estimates that he

spends up to 40 percent of his time tracking down research money. He and his colleagues increasingly look to other countries because it's easier to get money from Portugal or Singapore than from the U.S. "The big issue with federal grants is that they are extraordinarily time-consuming. We've gotten more money from international agreements that require less time to administer," he says.

Getting funding, agrees Berkeley's Arens, has "been a nightmare" in recent years. "It might get better when Obama's people can open the valve."

The new administration *has* opened the valve to allow an influx of money from the American Recovery and Reinvestment Act. Our latest crisis has resulted in a new wave of funding for building science, with some funds steered toward the DOE and NIST for initiatives such as net zero housing. **But it remains to be seen whether the research community is prepared to take full advantage of this one-time subsidy.** "Over the last decade or two, the federal investment has really dwindled," Frankel says. "Now there's this infusion of money, and frankly, there is no one to do the work."

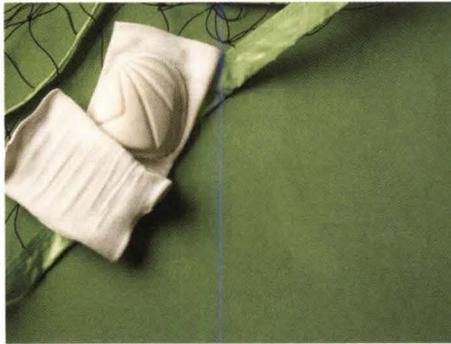
Because the foundation for research has been so corroded, because there is no national agenda or federal agency steering the ship, and because industry has not seized the initiative, there is concern that the money won't go to the best use.

"The architectural field is so slow compared to any other kind of science. It's just amazing," Arens says. "I'm looking back at my career and it rankles because I did a lot of things, but we could have done so much more. There could have been better progress." □

# WORKING WITH THE INVENTOR OF RECYCLED RUBBER?



AktivLok



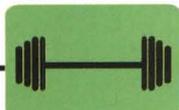
Kombi



Aktiv

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That's "wonderful" in English. But you knew that. What you might not know is that, over 40 years ago, a German company invented the technology to recycle tires into sports and fitness flooring. They called it Regupol. So what does working with the inventor get you? The deepest experience and expertise, for starters. Add to that the cleanest raw material, consistent color infusion, killer custom colors and custom lengths, and the best in design, durability and performance. Get to know the inventor. In no time, Regupol America will have you fluent in words like "wunderbar." And maybe even "spektakulär."



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# → BUILDING

① 2 3



The new Traverwood Branch Library in Ann Arbor, Mich., uses wood from nearby ash trees killed by the emerald ash borer in a very local lesson about sustainability.

TEXT BY BRADFORD MCKEE

## TRAYERWOOD BRANCH LIBRARY

ANN ARBOR, MICH.  
INFORM STUDIO

**BY THE TIME** planning began four years ago for the new Traverwood Branch Library in Ann Arbor, Mich., it was tragic but not surprising for the architects at Inform Studio, of nearby Northville, to find dozens of dead ash trees on the proposed building site. Since 2002, some 30 million ash trees in southeastern Michigan have fallen prey to the emerald ash borer, a beetle thought to have boarded a ship or plane from Asia to the Midwest that has since spread to at least 14 states. Its larvae kill trees by eating their inner bark.

Early in a design process focused on sustainability, the library's architects at Inform realized the dead trees' wood could become part of the library itself. It worked: The ash trees were used to make interior flooring, wall panels, ceilings and, conspicuously, a row of expressive columns along a bank of windows facing south into a nature preserve, their naked, sealed surfaces visibly scarred in rune-like patterns by chewing borers. "A happy accident" — and a guiding one, says Cory Lavigne, the firm's design director.

Under the direction of artisan woodworker John Yarema, based nearby in Troy, Mich., the team employed draft horses to help move the ash logs, which were cut by hand, and began a yearlong process of air-drying the wood in Yarema's shop. Such an intensely local material would add to the design's ecology-minded strategies.

Those strategies start with an L-shaped footprint for the 16,776-square-foot building, pushed to the street edges of the four-acre site to avoid intruding on the surrounding woods. Parking beneath the building, plus the city's permission to have 29 cars park on the street, reduced the city's parking requirement to only 26 paved spots on the site. Cost-cutting sacrificed a green roof, but a rain garden, planted with sedges, slows down and helps filter stormwater runoff that percolates into a nearby retention pond.

Inside the library, narrow floor plates allow the sun to light the warm, ash-lined reading areas. The massing also promotes passive ventilation through operable windows activated by low-voltage actuators, which tie back to the mechanical systems. Window blinds on south- and west-facing façades are controlled by daylight sensors to cut unwanted glare.

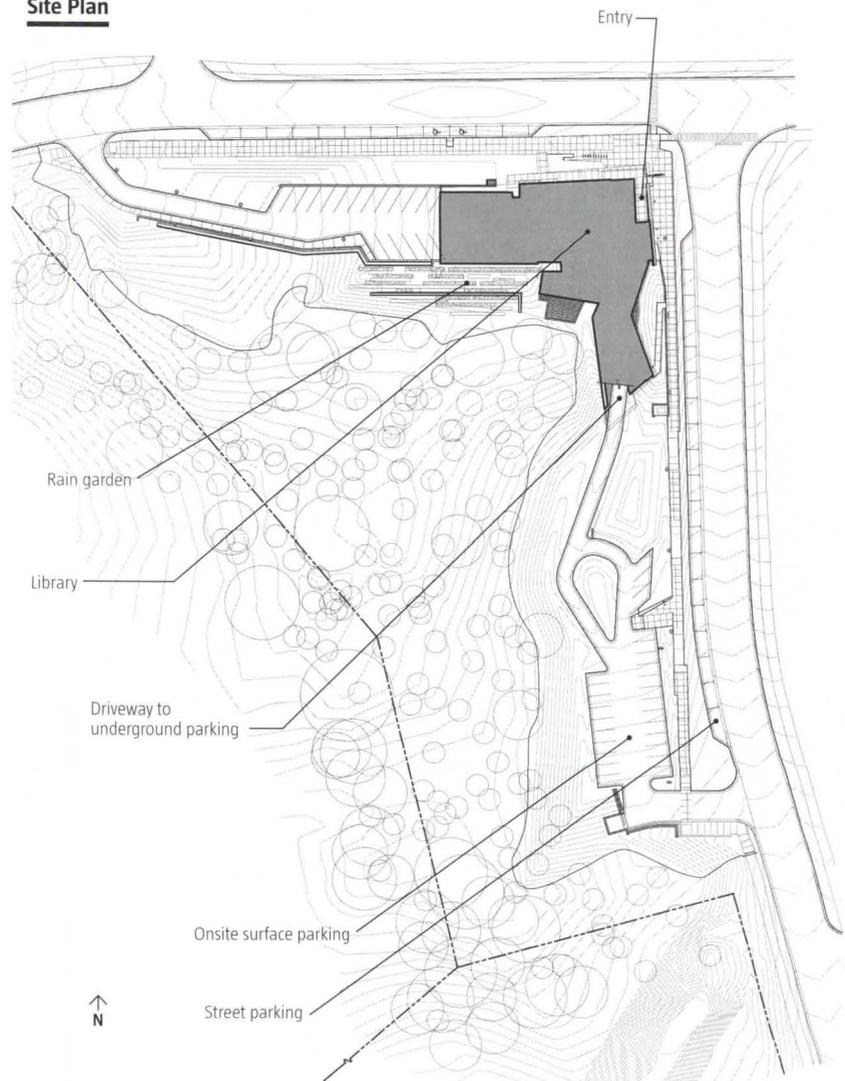
The Traverwood library is the third new branch built by the Ann Arbor District Library under its current director, Josie Parker, who wanted a sustainable building design but didn't initially expect, before the ash-tree epiphany, how poignant the results would be. People, not least children, may see the logs and ask what damaged them. The answer points back to a constant consumer demand for cheap imported goods in a global economy, which has hurt places like Michigan well before the emerald ash borer arrived.

The architects at Inform followed the U.S. Green Building Council's playbook closely but didn't apply for LEED status because, quite simply, the money on certification could be used in the building itself. "In our community, it isn't necessary to pursue LEED to have a project validated and supported," Parker says. "What's important in Ann Arbor is that we do the right thing by our community."



1

#### Site Plan





**1.** The massing of the Traverwood Branch Library consists of articulated volumes that form an L-shape on the site. Thin forms allow daylight to penetrate deep into the building and small, vertical windows on the southernmost façade admit light while protecting the building from glare and heat gain.

**2.** Visitors enter the building via a glass-clad lobby on the building's northeast corner. The ash planks harvested from the emerald ash borer-infected trees can be seen on the underside of the soffit over the main door, a prelude to the wood's use throughout the interior. Recessed strip lighting in a staggered pattern calls to mind the pattern of windows on the southern façade and elsewhere in the building.

#### Project Credits

**Project** Traverwood Branch Library, Ann Arbor, Mich.

**Client** Ann Arbor District Library

**Architect** Inform Studio, Northville, Mich. — Kenneth Van Tine (technical design principal); Gina Van Tine (marketing, managing principal); Michael Guthrie (design principal); Cory Lavigne (design director, project architect); Andrew Mannion, Lindsay Cooper, Amy Baker, Jason Roberts, Elizabeth Huck, Melissa Alexander (project team)

**Associate Architect** VPS Architecture  
**Mechanical/Electrical** Durkin & Villalta Partners

**Landscape** Grissim Metz Andriese Associates

**Structural** Robert Darvas Associates

**Construction Manager** O'Neal Construction

**Ash Wood Contractor** Yarema Creative Hardwood Flooring

**Size** 16,776 square feet

1. Wood is the predominant finish in the lobby, making up the floor, walls, under-soffit ceiling, and most of the furniture. In addition to telling a local story and adding to the sustainability agenda, the material is durable and can withstand the high foot traffic, and the variegated color of the planks on the walls will hide the inevitable wear and tear on the building.



2. Some of the ash trees were stripped of their outer bark, left whole, and used as columns along the curtain wall facing the nature preserve. Operable windows within this wall are controlled by low-voltage actuators to promote natural airflow into the building, and automatic shades (hidden behind ash planks) close to limit heat gain and glare in the reading room during the brightest parts of the day.

3. The warmth of the ash planks plays against exposed aluminum and glass fenestration. Careful detailing allows the planks in the ceiling to neatly navigate curves and corners, as seen here in the transition space between the stacks and the casual study area.

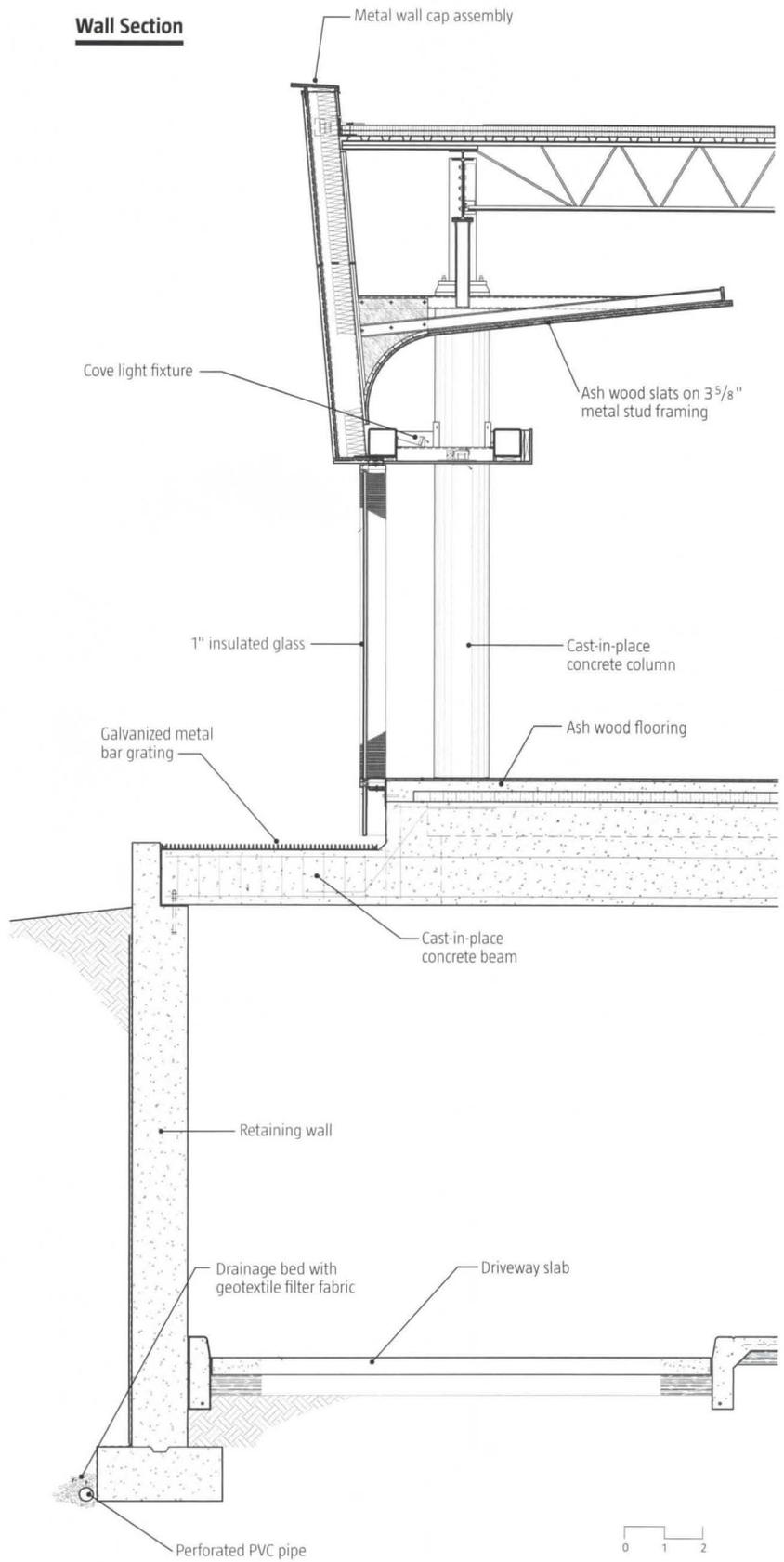


RIGHT AND BOTTOM LEFT: JUSTIN MACONOCCHIE PHOTOGRAPHY; TOP LEFT: JAMES HAEFNER PHOTOGRAPHY



3

**Wall Section**

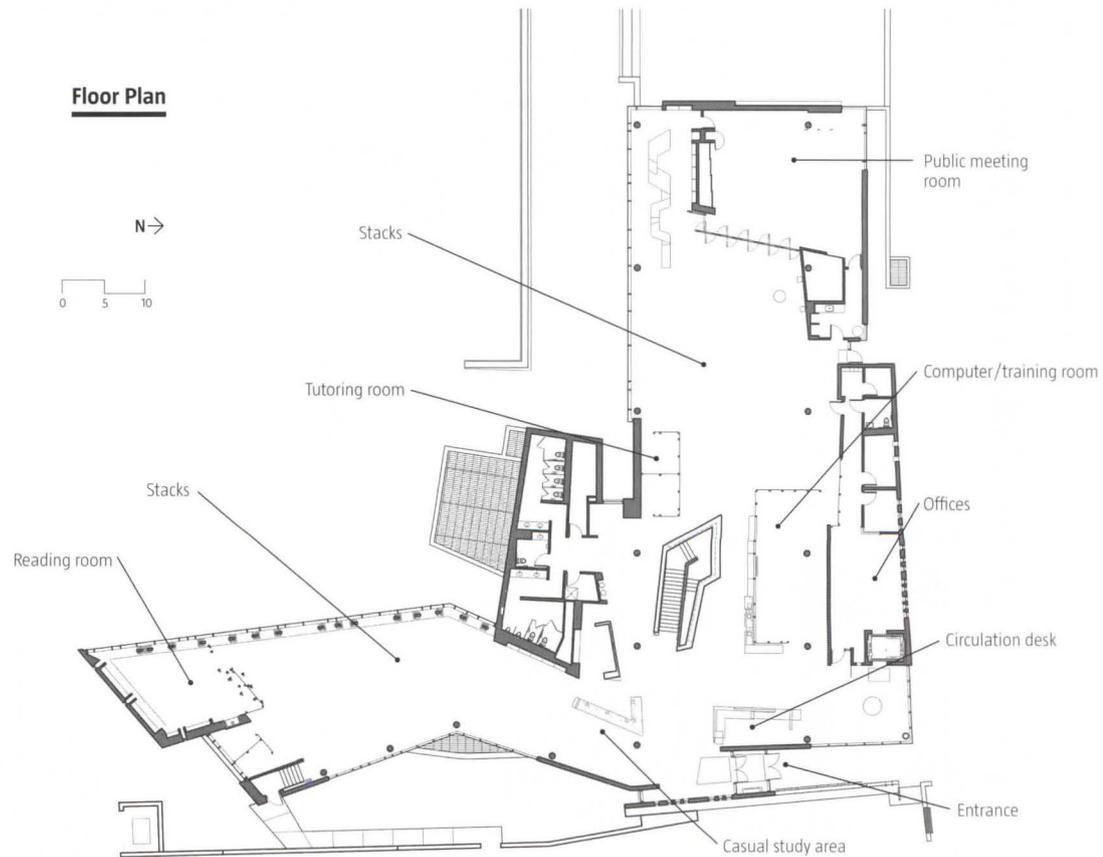


1. Technology is omnipresent in the library. Visitors can search for titles at computer terminals at the information desk, and video screens mounted near the entrance display library events and information. Touchdown space for those using their personal computers for work or research is provided in the form of wood tables with inset power management.

2. In addition to the natural wood columns, a bent-wood screen creates a sculptural point of interest, and serves the practical purpose of setting the reading room off from the stacks. Indirect light fixtures throughout create a diffused glow that provides enough light without straining the eyes of those reading, but during the day, natural light is the primary illumination in the space.



### Floor Plan



TOP: JUSTIN MACONOCHE PHOTOGRAPHY;  
BOTTOM: JAMES HAEFNER PHOTOGRAPHY



1

## TOOLBOX

### 24-Volt Motorized Window Actuator System

Clear Line  
[clearlineinc.com](http://clearlineinc.com)

When the outside temperature and humidity are right, this actuator system opens the library's operable windows to allow passive ventilation and cooling. Each window has its own actuator, which ties into the building's thermostat. The actuators require a plus or minus 10-degree differential from the desired temperature to open or close windows.

### OpenLight Roller Shades

Creative Windows  
[creativewindows.hdwfg.com/sb.cn](http://creativewindows.hdwfg.com/sb.cn)

The library's south- and west-facing glazed façades have automatic shades that descend or rise to one of four positions—fully up, 30 percent down, 60 percent down, and fully down—when light reaches specified levels. OpenLight LTSEN-INT-V2 sun sensors, mounted on mullions, trigger the shades' response. The sensors can be programmed to delay the response by 10 to 60 minutes, so that passing clouds or driveway lights don't trigger the system needlessly.

### Stormwater Management Chambers

StormTech  
[stormtech.com](http://stormtech.com)

Even after minimizing the library's surface parking, Inform needed to anticipate excess stormwater and keep this potentially polluted runoff from quickly overwhelming a nearby retention pond. Three StormTech collection chambers lie underground below a rain garden, where water initially collects. The chambers help filter water and release it gradually into the retention pond.

### Galvalume Custom Panels

Advanced Architectural Products  
[panels.com](http://panels.com)

These exterior panels were fabricated for the Traverwood library by Advanced Architectural Products of Allegan, Mich., as a custom concealed-fastener system with Galvalume (an aluminum-zinc alloy) and a 1-inch foam insert. Panels of varying widths (8, 12, and 14 inches) secure to adjacent panels and into the building's exterior-grade plywood sheathing.



2

# How do you define sustainable lighting?



**sustainable lighting** [lī't-kən-trōl]  
- adjective - noun -

Lighting systems that provide high quality visual environments with limited impact on the natural environment. Includes:

- a: Control solutions** - integrated daylight harvesting, occupancy sensing, and AV switching controls
- b: Cradle to Cradle** - third party certification of sustainable product design and manufacturing practices
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- f: Spatial envelope** - lighting systems that light architectural ceiling and wall surfaces for comfortable, pleasant environments
- g: Made in USA** - US-based factories that exceed strict environmental regulations

**su•ture**  
n. a: material wound together which two things are joined if by sewing

**su•zer•ain**  
n. a: a feudal political control relations of an overlord

**sv•el•te** adj [F, fr svellere, fr. eou slender, lithe

**svgs** abbr. savings

**SW** abbr. a: shortwa

**'swab** n. a: mop b: a w

rial esp. for app

cleaning; also: a

swab **c:** sailor

**'swab** vb. swabb-

: mop sw

bind (an

wrap up

**swaddling** clothes n. pl

wrapped around an

swaddling

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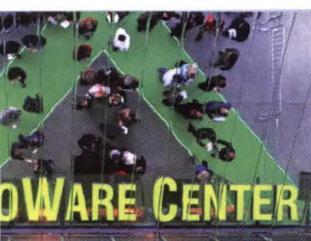
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# SHOWARE CENTER

KENT, WASH.  
LMN ARCHITECTS

**IT'S GAME NIGHT.** Hockey fans driving to the Seattle Thunderbirds' new home in Kent, Wash., can see the arena long before they hit the gates, and when they get closer, the steel and glass façade reflects green streaks, red taillights, and spectators approaching the lobby. As the Zamboni takes its spin around the ice, the parking lot fills with cars. Anticipation builds.

Seattle-based LMN Architects' scheme for the 154,400-square-foot multiuse ShoWare Center (the ice sheet can be covered and the seating reconfigured for concerts) choreographs that time between getting out of your car and arriving at your seat. "We analyzed all the architectural elements according to how they create the complete sequence, and how they culminate in the overall dramatic experience," says LMN design partner Mark Reddington. "That experience starts when you see the building. It extends into the community, even to those who aren't going to the event."

Indeed, the atmosphere is electric, literally. Green lines painted on the ground and trimmed with LEDs radiate out from the glazed public concourse into the parking lot, serving as paths to the building's entrance. Spectators are greeted by a large sloping mirrored stainless steel soffit, which reflects everything from fans to supergraphics, making even a half-full house seem dizzyingly energetic.

But behind the glitz and sporting paraphernalia is a thoughtfully engineered building that flouts the perception that sporting venues cannot be paragons of environmentally conscious design. In most arenas—especially ice rinks—heating, cooling, and electrical loads are high, but with a carefully designed HVAC system, the ShoWare Center is on track for LEED Silver certification. Efficient space planning accounts for a chunk of the building's overall sustainability; by placing the rink on grade and looping the concourse around its perimeter, Reddington was able to tuck concession stands and restrooms under the bleachers, while back-of-house facilities such as locker rooms and offices were consolidated on the arena's north side. Site tactics such as stormwater management and recharging nearby wetlands with roof rainwater runoff added LEED points, as did the use of local and recycled materials. But for Reddington, making the building eco-friendly wasn't the driving force behind the design. "The building is sustainable, but it is not a showcase of green elements. It is fundamentally designed around *how people use the space*," he says.

And while the sustainable elements of the building are worth celebrating, most fans likely won't even notice. They have other priorities—and for them the real show starts when the Thunderbirds hit the ice.

TEXT BY MIMI ZEIGER  
PHOTOS BY LARA SWIMMER

1. LMN Architects took cues from its experience in theater design when programming the center, using lighting and supergraphics to choreograph the visitors' experience from the highway approach all the way through to reaching their seat for the game.

2. The second-floor cladding is composed of white 22 gauge metal panels. Staggering the panels, some of which are slightly recessed, adds texture to the surface. The swell of the roof—supported inside by massive steel trusses—is clad in a similar material with smaller-scale horizontal metal ribs.

#### Project Credits

**Project** ShoWare Center, Kent, Wash.

**Client** City of Kent

**Client's Representative** Shields Obletz Johnsen, Seattle

**Architect** LMN Architects, Seattle—Rob Widmeyer (partner in charge); Mark Reddington (design partner); Tom Burgess (project manager); Rafael Viñoly-Menendez, Kristi Paulson (project designers); Michael Petersen (project architect); John Woloszyn (technical architect); Todd Charlton, Caleb Menge, Marion Gee (architects); Robin Dalton, Dawn Polak (interior designers)

**General Contractor** Mortenson

**Ice Sheet/Bowl Design Consultant** PBK Architects

**Structural/Civil Engineer** Magnusson Klemencic Associates

**Mechanical Engineer** Wood Harbinger

**Electrical/Acoustical Engineer** Sparling

**Geotechnical Engineer** Shannon & Wilson

**Landscape Architect** Site Workshop

**Electrical/Mechanical Consultant** Genivar

**Lighting Consultant** Candela

**Graphics/Signage** Widmeyer Design

**Food Service** William Caruso + Associates

**Code Consultant** Flack+Kurtz

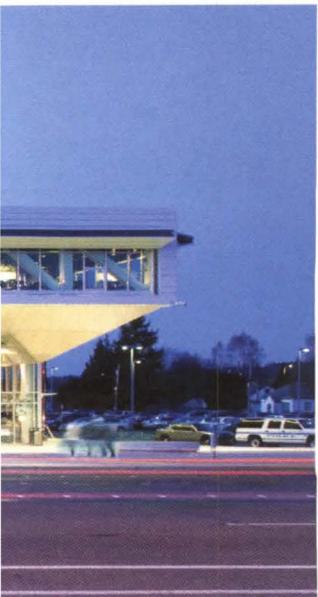
**Cost Consultant** Davis Langdon

**Sustainability Consultant** Paladino & Co.

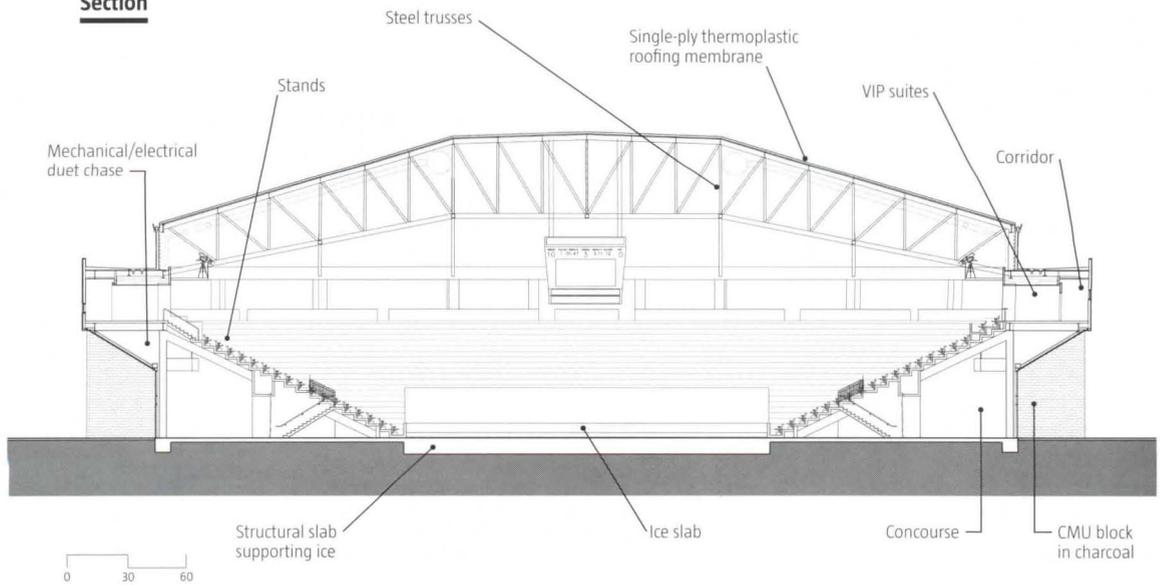
**Size** 154,400 square feet

**Cost** \$63 million





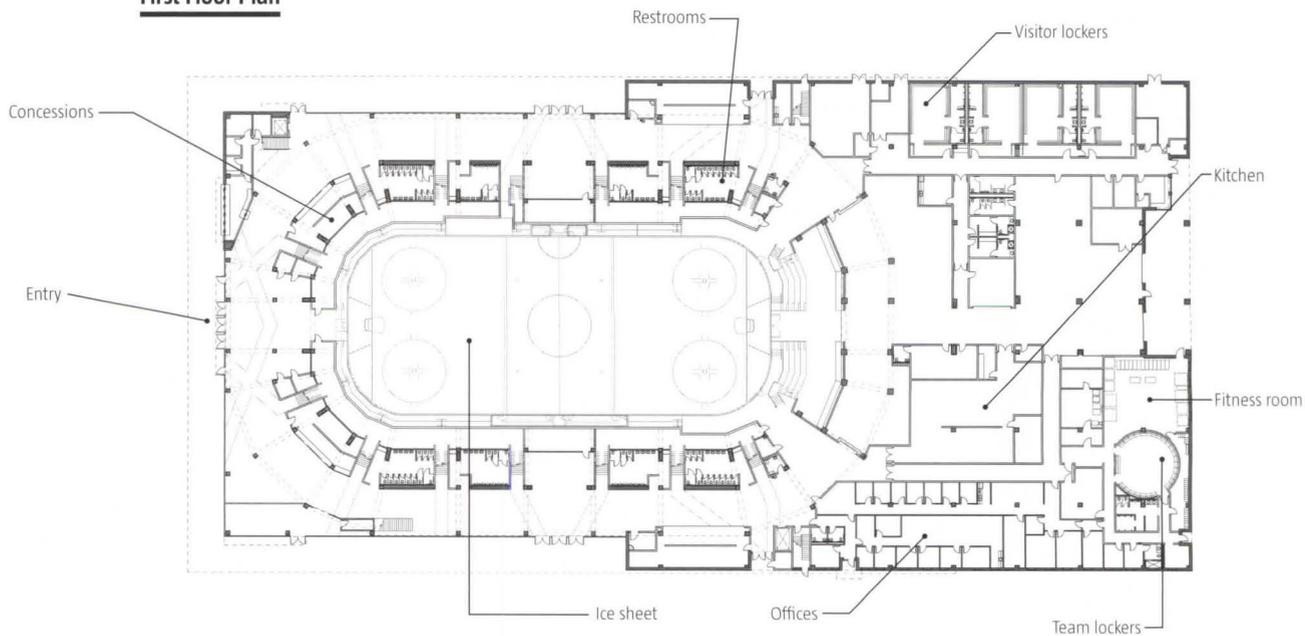
**Section**



1. The windows that penetrate the metal siding over the entrance belong to the club lounge. Located at the southwest corner, the lounge has expansive windows that offer a view of Mount Rainier. Natural light from the windows reaches into the bowl, but during events, shutters made from airplane hangar doors block the light. Also on this second level are VIP suites, crucial to the ShoWare Center's financial model, that run the length of the ice sheet on either side.

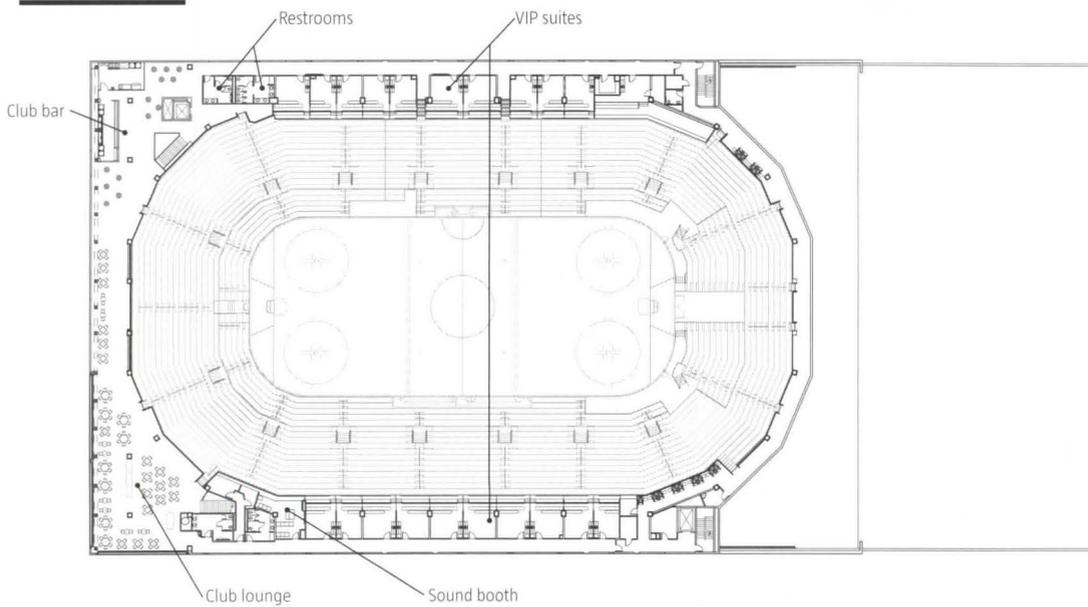


**First Floor Plan**





**Second Floor Plan**

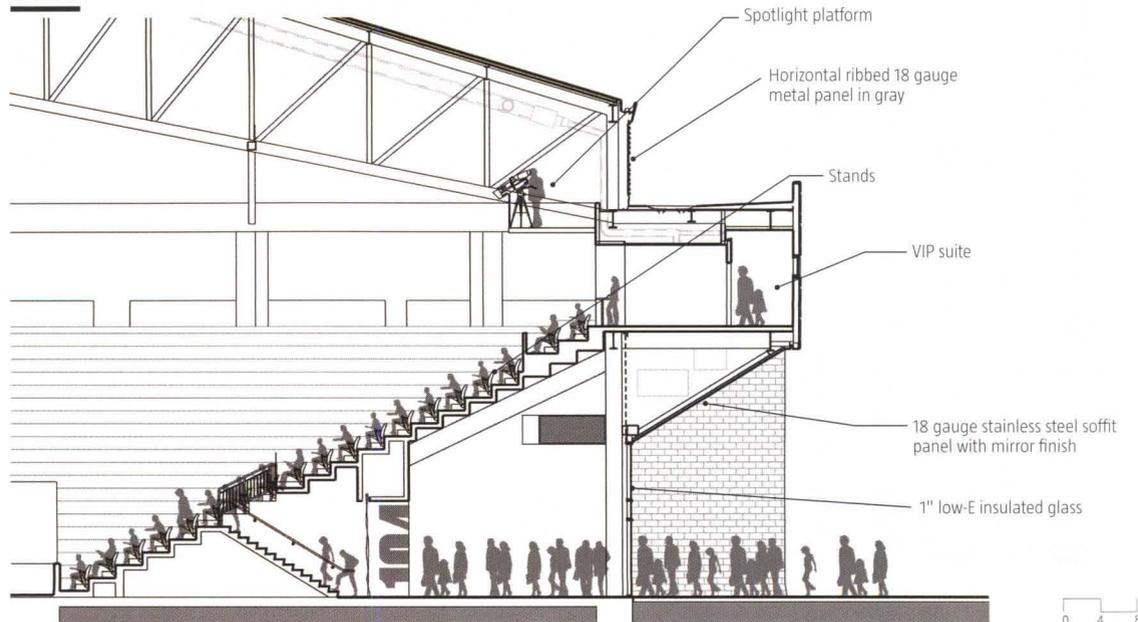


1. The vivid green lines that start in the parking lot continue through the lobby and the gates to the different sections of the hockey arena. The industrial space—with polished concrete floors and black-painted cinder block walls—is enlivened by supergraphics. Large green numbers mark each door, and large white stylized figures indicate the restrooms.

2. The ice sheet in the arena is used for the Thunderbirds' home games. In the off-season, it can be used for traveling shows such as the Ice Capades. Also, the ice sheet can be covered to turn the space into a concert venue. During those events, the capacity increases by 1,700 seats.



### Section



## TOOLBOX

### Linear In-Ground, Street 15, LED Lighting

Aldabra Contemporary Lighting Technology  
[strategiclighting.com/brands/aldabra](http://strategiclighting.com/brands/aldabra)

LMN Architects used bright green LED lighting to track the entrance paths through the parking lot and into the ShoWare Center concourse. Highly efficient at just 5 watts per meter, the linear in-ground LEDs provide a theatrical splash with a low energy load.

### Wall-Mounted Water Closet and Touchless Lite Urinal

Kohler  
[kohler.com](http://kohler.com)

When more than 6,000 hockey fans fill ShoWare, you can be sure the public restrooms see some action. To conserve water, LMN Architects chose the water-efficient low-flow Bardon toilet from Kohler, equipped with a Sloan Valve dual-flushometer. Each fixture is equipped with a push-down handle for a full flush and lift-up handle for reduced flush. In the men's room, low-flow urinals use a mere half gallon per flush.

### Interior Enviro-Coat Paint

Kelly-Moore Paints  
[kellymoore.com](http://kellymoore.com)

Surfaces throughout the building are painted with Enviro-Coat paint. With low-VOC off-gassing and antimicrobial properties to control odor, the acrylic wall paint promotes good indoor air quality. The paint also resists film attack by mildew, an important factor in the damp Pacific Northwest.

### PureBond Plywood Architectural Millwork

Columbia Forest Products  
[columbiaforestproducts.com](http://columbiaforestproducts.com)  
 Drawing on the resources of the Pacific Northwest's forests, the architects specified Columbia's PureBond plywood for the Thunderbirds' locker room. The manufacturer uses sustainable harvesting practices, making its plywood LEED compliant and FSC certified. To maintain good air quality in the arena, the product is formaldehyde-free.



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TEXT BY KATIE GERFEN  
PHOTOS BY TIM GRIFFITH

The new 80,000-square-foot San Francisco Friends School turned an old jeans factory into a sustainable learning environment for children.

# FRIENDS SCHOOL

SAN FRANCISCO  
PFAU LONG ARCHITECTURE

**WHEN THE SAN FRANCISCO FRIENDS SCHOOL** opened its doors eight years ago, it did so with a mission to foster academic excellence, as well as to educate children in Quaker values of social responsibility. So it's only fitting that when the school decided to expand into a larger space, it looked to reuse an existing structure instead of building from the ground up. The school hired Pfau Long Architecture—a local firm with a commitment to sustainability—to remake the historic Levi Strauss & Co. factory into a center for learning.

The old factory was built soon after the 1906 earthquake and fire, and it required massive structural retrofitting. The factory's wood construction was controversial at the time, and not solid enough by today's standards. Pin beams were placed around the wood columns to support the building, and the brick column foundations were demolished and replaced with steel. Seismic bracing was added throughout and left exposed. "The old building is treated with complete honesty and the new systems are added with complete frankness, which is kind of a Quaker idea," says Pfau Long principal Peter Pfau.

Aesthetic changes were made as well—including the removal of Wild West saloon-style trim on the building's exterior. But some elements were preserved, including the wooden factory floor. Jeans magnate Levi Strauss had his employees lay the floor rather than lay them off during the Great Depression, and the stains and scuffs of years as a working factory remain in place. "The contractors wanted to sand them down," Pfau says, "but I said no way. This way the history is alive in the building."

New elements were added to modernize the building while still keeping it sustainable—including four thermal towers, one on each corner of the building (see page 97). Using these towers to control natural ventilation and airflow, the architects were able to avoid installing traditional HVAC systems, except in the bathrooms and a computer server room. The natural ventilation system and a radiant heating system are both controlled by a direct digital-control building management system, which monitors temperature and air quality.

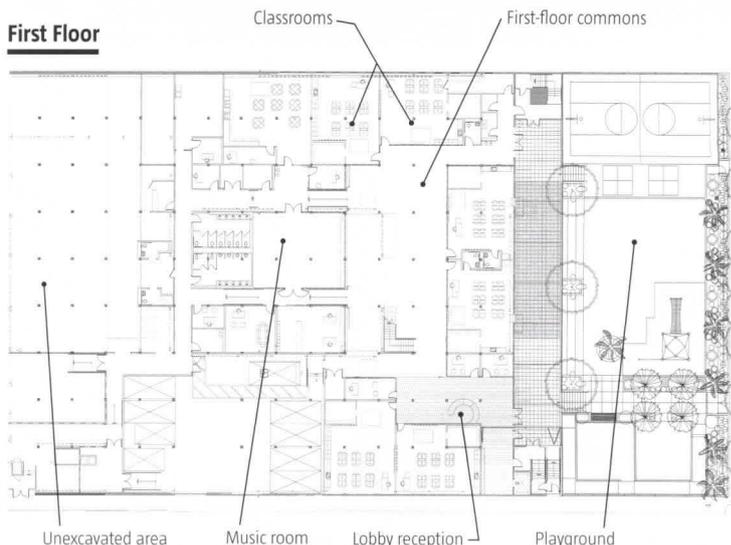
The renovated building is organized around a series of communities, defined by age or subject. The kindergartners, first, and second graders are on the ground level, for example, and all science classes take place in the second-floor science commons. This organization is for expediency's sake, but also in the hopes that the younger children will be inspired by the enthusiasm and work of the older ones. Also on the second floor is a library and a large meeting room, where the students and faculty—in the Quaker tradition—can sit in silent reflection. The room can be opened to a cafeteria next door to house larger events and all-school assemblies. Finishes throughout the interiors are mostly limited to painted white surfaces, light wood, and glass.

The building isn't finished yet: Classrooms on the third floor were completed in time for the start of the school year, but construction on an indoor gymnasium and an art commons are still under way. But despite the work in progress, student art and projects adorn the walls, and the children clearly have made the space their own.



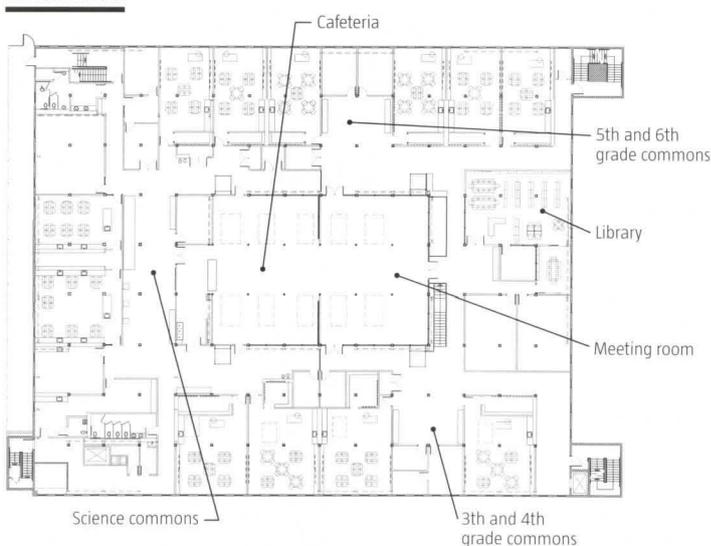


## First Floor



1. The San Francisco Friends School is located in a largely residential area in the Mission District. The building is fronted by a play yard that is fenced in from the street and has a basketball court, a playground, and bleacher seating for outdoor assemblies.

## Second Floor



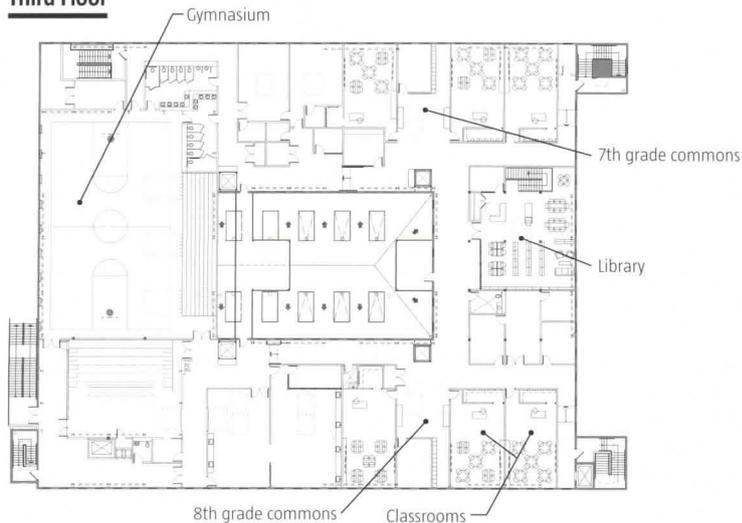
2. The first-floor commons is a central gathering space for the kindergarten, first, and second grade classes—who are required by law to be on the ground floor. “They have their own little universe down there,” Pfau says. All classrooms and a music room open onto the commons, which also features an exhibit on the history of the building and its use as a denim manufacturing plant. In fact, the reception desk (above) was a store prototype left in the factory and has quotes from Levi Strauss inscribed in the concrete top.

## Project Credits

**Project** San Francisco Friends School—San Francisco  
**Client** San Francisco Friends School  
**Architect** Pfau Long Architecture, San Francisco—Peter Pfau (principal-in-charge); Kami Kinkaid (project manager); Natalie Kittner (job captain)  
**Historic Architect** Page & Turnbull  
**Landscape** Miller Co.  
**Structural Engineer** Forell/Essesser Engineers  
**M/E/P Engineers** Timmons Design Engineers  
**Geotech & Environmental** Treadwell & Rollo  
**Civil** KCA Engineers  
**Telecom, Security, A/V, Acoustical** Shen Milsom Wilke  
**Phase 2 Acoustical** Nigel Breit Acoustics  
**Code** Rolf Jensen & Associates  
**Lighting** Revolver Design  
**Theater** Auerbach Pollock Friedlander  
**Waterproofing** Simpson, Gumpertz & Heger  
**Specifications** JPM  
**Signage** Public  
**Contractor** Plant Construction  
**Electrical** Decker Electric  
**Electrical/Security** The Engineering Enterprise  
**Elevator** Edgett Williams Consulting Group  
**Size** 80,000 square feet



## Third Floor



## BUILDING 1 2 ③

1. Seismic bracing was added to bring the building up to code. But instead of hiding the bracing, the architects left it exposed in common spaces, hallways, and even classrooms. The goal was to be transparent about the renovations made to the building, so the design can be a learning tool to educate the students about design and engineering.

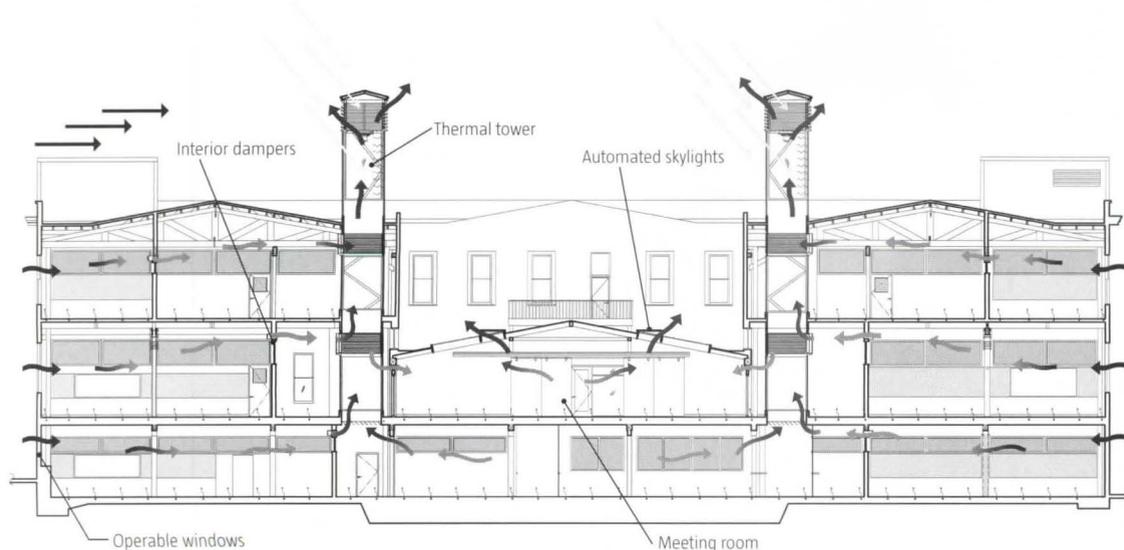
2. On the second floor, clerestory windows were installed in every classroom wall to allow natural light from outside to come through to the corridors. The wood floors in this space are the same floors that Levi Strauss had his workers install to avoid being laid off during the Great Depression, when jeans manufacturing was down. The staining and scarring on the wood has been preserved so students can see where the production line machinery sat when the building was an active factory.

3. The meeting room is a place where the students and faculty come to engage in the Quaker tradition of silent reflection. Located at the center of the second floor of the three-story building, the room actually has skylights because the roof of this central section is over the second story; windows on the doughnut-shaped third floor look down onto this lower roof. The skylights had been covered when the factory was still in operation, but they were restored and upgraded to flood the room with light. Now each skylight is fitted with a mechanism that is connected to the building's direct digital-control building management system, and the skylights automatically open and close to regulate temperature and draw air through the space. Interior windows on the perimeter of the room bring additional daylight to the second-floor corridors.





### Section Showing Airflow



## TOOLBOX

### Corbel Reinforcement Plates

Simpson Strong Tie  
[strongtie.com](http://strongtie.com)

Pfau Long Architecture worked with Simpson Strong Tie to customize a piece of hardware that would allow moment connections to be made in the existing wood structure without drilling through the beams. When the structure was built, the beams were not physically connected to the wood columns with any hardware. This customized plate minimized the labor and cost involved in a retrofit, while still retaining the original structure.

### Custom Radiators in Cooling Towers

Runtal Radiators  
[runtalnorthamerica.com](http://runtalnorthamerica.com)

The thermal towers work like chimneys, drawing warm air up and out of the building, and drawing cool air from the perimeter. Normally this is accomplished with a solar-heated steel plate, but on cloudy days, or when the plate doesn't create enough heat on its own, custom heaters pump out warm air to achieve the same effect.

### Fire Smoke Dampers

Ruskin  
[ruskin.com/fjsd](http://ruskin.com/fjsd)

The dampers are installed above each classroom door to keep smoke out in case of fire. But these dampers also are an intrinsic part of the building's natural ventilation system. The vents are controlled by the building's direct digital control (DDC) system, and are opened and closed automatically to allow airflow to regulate temperature and indoor air quality.

### Radiant Floor Heating Control

Zurn  
[zurn.com](http://zurn.com)

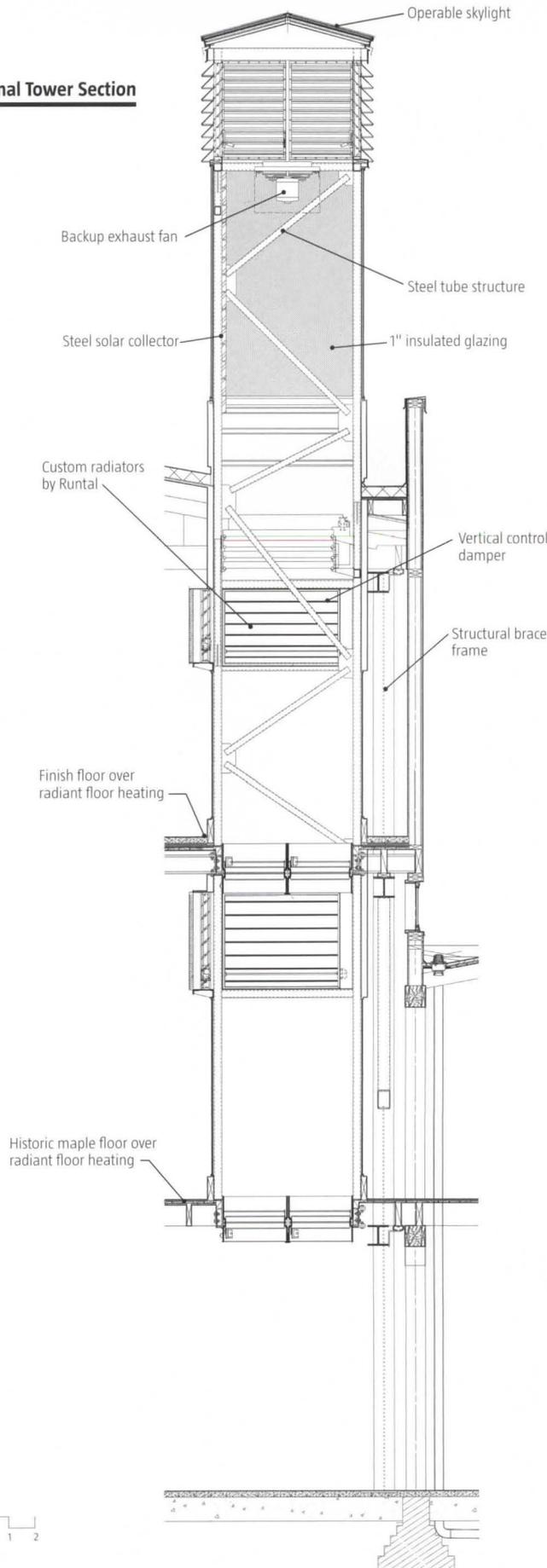
This control allows the radiant floor heating system sensors to communicate with the building's DDC building management system. This means that not only can the DDC system control the opening of vents and skylights, and thus control airflow through the building, but it also can control how hot each section of radiant flooring gets and disperse heat through the building in the cooler months.

1. The second-floor library is a good example of the school's overall materials palette. Walls are painted in Chantilly Lace, an off-white low-VOC paint from Benjamin Moore. Light wood furniture from Community Playthings and maple shelving (a collaboration with Ross McDonald & Co.) allow for a neutral and focused study environment, and direct/indirect P-60 linear light fixtures from Prudential Ltg. supplement natural daylight.





**Thermal Tower Section**



**THERMAL TOWERS**

The thermal towers are the core of the natural ventilation system in the school. Located in all four quadrants of the building, the shafts of the towers extend down into the floor plates and are lined with vents at each floor level. These vents, as well as the those at the top of the towers and above the doors of each classroom, are controlled by the building's direct digital control (DDC) system, which manages the building's temperature and energy use.

The top of each tower has glass walls that allow sunlight to enter. An untreated steel plate is "charged" by solar energy and creates enough heat that the air naturally rises and flows out through the topmost tower vents. This air movement creates a draw that pulls air out from the lower floors through the building, creating active natural ventilation. Sensors in various rooms trigger the DDC system to open and close vents and skylights to control airflow and maintain a comfortable temperature.

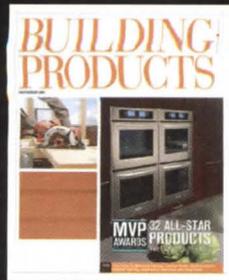
Normally, a building façade would require installation of trickle vents so that small amounts of air could flow into the space even when windows are closed. In the case of the Friends School, says Pfau Long Architecture principal Peter Pfau, "the old façade leaks so much that we didn't have to."

The towers were part of the discussion with the client from the initial meeting and something that Pfau had wanted to implement for quite some time. "Using thermal towers and natural ventilation meant we eliminated duct work," Pfau says, "which is more respectful of the building's historic character."



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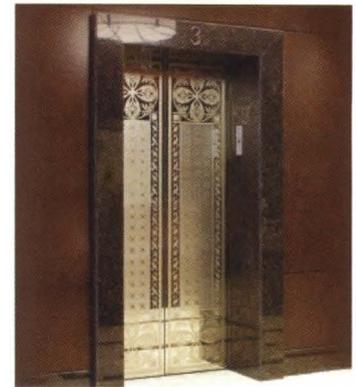
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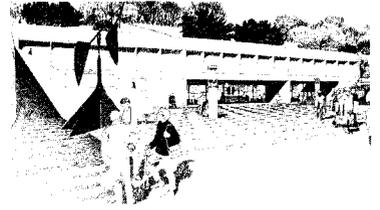
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→1970 AND 1976 P/A AWARDS

# THE HILLTOWN AND THE MEGASTRUCTURE



THE DESIGN FOR THE **ART CENTER COLLEGE OF DESIGN** IN CALIFORNIA WON A P/A AWARD IN THE 1970s—NOT ONCE, BUT TWICE.

TEXT BY THOMAS FISHER

#### 1970 P/A Awards Jury

C. William Brubaker  
Bruce Graham  
William Mouton  
Robert Venturi  
Thomas Vreeland

#### 1976 P/A Awards Jury

Donald Appleyard  
Arthur Cotton Moore  
W. Russell Ellis  
Gary Hack  
Cesar Pelli  
Raquel Ramati  
Stanley Tigerman  
William Turnbull

**TWO DIFFERENT CALIFORNIA ARCHITECTS** won P/A awards for the same project: the Art Center College of Design.

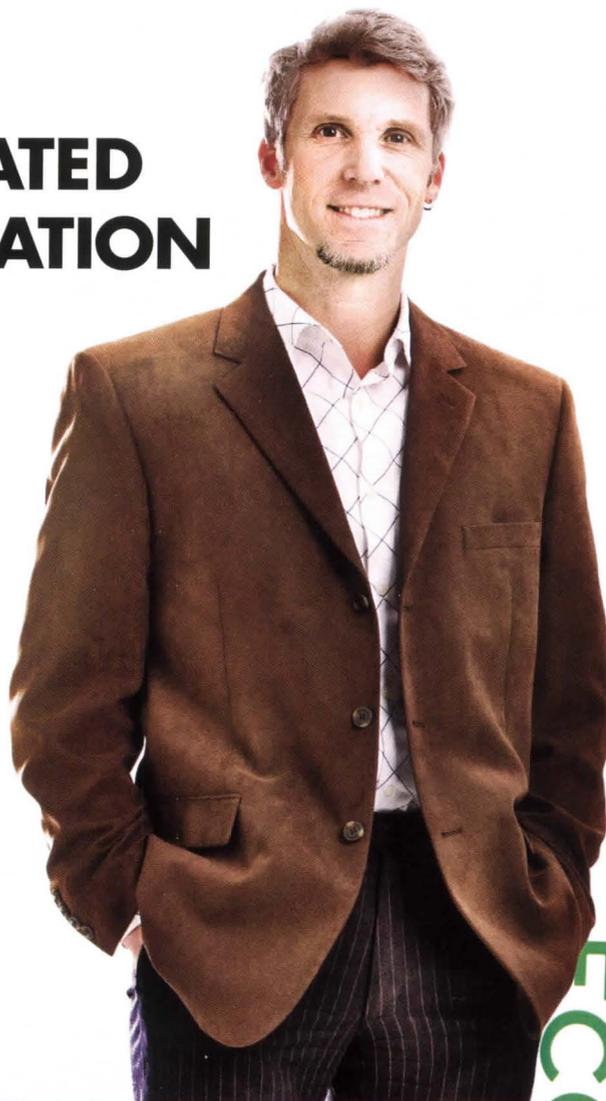
In 1970, Honnold, Reibsamen & Rex received an award for its modernist hilltown, with studios, housing, and support spaces in a concrete structure that stepped down its sloping Los Angeles site. That design (top right) revealed the strengths and weaknesses of terraced schemes: ample outdoor space and views, but excessive circulation space, building perimeter, and site coverage.

The college then switched locations—to Pasadena—and architects: Craig Ellwood Associates, which won an award in 1976 for the design that eventually was built (above). Ellwood's firm packed the college—minus housing—into a 165,000-square-foot Miesian megastructure whose center section, with exposed steel trusses, spans an arroyo and bridges dramatically over

the entry drive. Touting the efficiency of the design—within budget at \$30 per square foot—the architects alluded to the previous award winner, whose “ratio of corridor to work area was unrealistic, expensive, difficult to service, and hindered communication.”

And yet, Ellwood's Miesian rectangle, for all of its efficiency, flexibility, and elegant glass-and-steel detailing, also has its downsides, with many of the classrooms and studios having no natural light, and the circulation seeming circuitous in some places. The two Art Center awards, however, exemplify the debate at the time between those who favored more romantic, historically allusive architecture and those who adhered to more rational, machine-like Modernism. The latter won out at the Art Center College of Design, although the former ultimately prevailed. □

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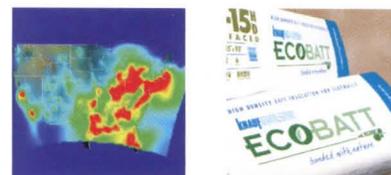
Kevin Gurney, PhD  
Project Director, the HESTIA Project  
IPCC Member Co-recipient of 2007 Nobel Peace Prize

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